A CHILTON PUBLICATION

the Iron Age

THE NATIONAL METALWORKING WEEKLY November 6, 1952

CONTENTS PAGE 2

National Bureau of Standards
Library, N. W. Bldg.
NOV 14 1952

hot strip mills

... designed and built by MESTA

Color Photo by E. D. MESTA

Mesta 68" Four-High Continuous Hot Strip Mill, Universal Stand

DESIGNERS AND BUILDERS OF COMPLETE STEEL PLANTS

MESTA MACHINE COMPANY • PITTSBURGH, PA.

How many SPARKS in a Spark Plug?

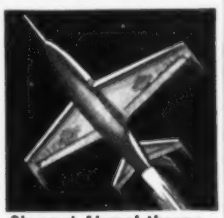
Surprising, the confidence that people have in spark plugs. No one stops to question how many "sparks" they're good for, because long-life performance has come to be taken for granted. Yet, when you get right down to it, you'll find good reasons for this complete consumer confidence. And, from a "sparking" point of view, perhaps the most important is the almost universal use of special Hoskins alloys for the vital electrode wires.

Producing the wire that sparks your car to power is a tough and tricky business. It requires special care in the selection of raw materials. Special melting and production techniques. Plus extremely close control over alloy composition and uniformity of quality throughout the entire manufacturing process.

Yet that's exactly the kind of alloy that Hoskins is qualified to produce best. For, among the other quality-controlled alloys developed and manufactured by Hoskins are: Alloy 717—for facing engine valves; Alloy 785—for brazing belts; Alloy 502—for countless heat resistant mechanical applications. Then, too, there are the Chromel-Alumel thermocouple alloys . . . guaranteed to register true temperature-EMF values within specified close limits. And, of course, Hoskins CHROMEL . . . the *original* nickel-chromium resistance alloy used as heating elements and cold resistors in countless different products.

Hot stuff for hot jobs! Hoskins Alloy 502 is ideally suited to many mechanical-structural applications.

Heating elements made of Hoskins Chromel deliver full-rated power throughout their long and useful life.



Chromel-Alumel thermocouple alloys accurately measure exhaust temperatures of jet aircraft engines.

Chromel® NICKEL CHROMIUM WIRE

HOSKINS

MANUFACTURING COMPANY

4445 LAWTON AVENUE, DETROIT 8, MICHIGAN

Bethlehem Pacific reinforcing bars are used in the concrete lining of Broadway Tunnel in San Francisco. General contractor is Morrison-Knudsen Company.

Broadway Goes Underground

TWIN TUNNEL BORES THROUGH SAN FRANCISCO'S RUSSIAN HILL

Broadway traffic that used to inch its way around Russian Hill in San Francisco now speeds straight through the heart of this famous landmark in a twin-tube tunnel. Cut deep beneath Russian Hill, the tunnel is a level link connecting two dead-ends of a street that have never met before. It makes Broadway a continuous thoroughfare.

The tunnel consists principally of two parallel tubes, each carrying two lanes of traffic. Circulation of air for both tubes is provided by a central ventilating system located at the tunnel's eastern entrance.

Each tube is 1365 ft from portal to portal, 28½ ft wide at the road slab, and 22 ft high. Reinforced concrete construction was used in building the two tubes. More than 2000 tons of Bethlehem Pacific reinforcing bars went into the lining of the tunnel and the floor of the ventilating building.

Bethlehem Pacific manufactures and fabricates reinforcing bars in all standard sizes at each of its three plants—in South San Francisco, Los Angeles and Seattle.

BETHLEHEM PACIFIC COAST STEEL CORPORATION

Sales Offices: San Francisco, Los Angeles, Portland, Seattle, Honolulu

Bethlehem Pacific reinforcing bars are made exclusively from new-billet steel that is uniform in analysis and ductility. They come in sizes ranging from number 3 to 11, with permanent, raised, size markings on each bar.

BETHLEHEM PACIFIC

BETHLEHEM STEEL

The Iron Age — DIGEST

Vol. 170, No. 19
November 6, 1952

CONTENTS

★ Starred items are digested on opposite page.

EDITORIAL

The Customer Is Back 7

NEWS OF INDUSTRY

★Special Report: Steel Skids on Strike Grease ... 103
★Raw Materials: Steel Items off Critical List 104
★International: Import Rate of Foreign Tools ... 105
★Expansion: Indiana Harbor Mill Mushrooms ... 106
Construction 108
★Transportation: Shippers Avert Ore Shortage .. 109
Production: Geiger Clicks Quicken in Colorado 110
★Miner-less Coal Mining 111
Manufacturing: NPA Orders Foul Gear Industry 112
★Labor: Diemakers Hunt for New Hands 114
★Controls: Will There Be Enough Consumer Steel? 115
Defense Contracts: Renegotiation for Half 116
Personnel: Iron Age Salutes 155
Iron Age Introduces 157
Clearing House 258

NEWS ANALYSIS

Newsfront 101
★Automotive Assembly Line 120
This Week in Washington 125
West Coast Report 129
★Machine Tool High Spots 131
Canadian Comment 133

TECHNICAL ARTICLES

★Alloy Tool Steels With Nitrogen 163
★Improved Stainless Good Up To 1200°F 166
★Metal Show Documents Technical Progress 170
Speed Plating of Small Diameter Steel Tubing .. 174
★Gear Tooth Design Modified For Better Service 176
★Bearing Races Machined At High Speeds 180

MARKETS & PRICES

★The Iron Age Summary—Steel Outlook 229
Market Briefs 231
★Nonferrous Markets 232
Iron and Steel Scrap Markets 236
Comparison of Prices 240
Steel Prices 242

REGULAR DEPARTMENTS

Dear Editor 9
Fatigue Cracks 11
Conventions and Meetings 13
Free Publications 135
New Equipment 140

INDEX OF ADVERTISERS 273

THE IRON AGE, published every Thursday by the CHILTON CO. (INC.), Chestnut & 56th Sts., Philadelphia 39, Pa. Entered as second class matter, Nov. 8, 1932, at the Post Office at Philadelphia under the act of March 3, 1879. $8 yearly in United States, its territories and Canada; other Western Hemisphere Countries, $15, other Foreign Countries, $25 per year. Single copies, 35¢. Annual Review and Metal Industry Facts Issue, $2.00. Cables: "Tronage," N. Y.

NEWS DEVELOPMENTS

STEEL PROFITS, OUTPUT SAPPED BY STRIKE—P. 103
Steel company earnings, production and shipments for both the third quarter and first 9 months continue to reflect impact of last summer's strike. Net for quarter about 24 pct less than last year. Excess profits tax features helped some. Steel firm heads still blasting at controls laws.

SOME STEEL ITEMS CUT FROM CRITICAL LIST—P. 104
DPA acknowledges easing by removing plate, cold-drawn bars, hot-rolled bars, semi-finished steel, and seamless tubing from "most critical" category. But they stay in the "short supply" group. Die blocks called "fair to good," castings under 3000 lb in near balance. Warning sounded on aluminum supply.

IRON ORE SHIPPERS NEARING REVISED GOAL—P. 109
Great Lakes vessels are moving into the home stretch in race to beat the freeze and prevent a shortage. New records set in August and September. Season total at end of October was over 63 million tons. November weather is the only "if." U. S. Steel, Bethlehem don't forsee need for all-rail movement.

CONTINUOUS COAL MINING BY PUSHBUTTON—P. 111
New remote-controlled mechanical miner takes the men out of the pits. Developed by Carbide & Carbon Chemical Co. during study of underground gasification. Electric sensory device tells operators when cutting heads wander out of coal seam. Improved version scheduled for spring trials.

LACK OF LABOR IS DIEMAKERS' MAIN PROBLEM—P. 114
Shortage of apprentices, skilled workers and worries over the future are the main problems aired at tool and diemakers annual convention. There just aren't enough young men entering the field to supply needs. Time required to reach skilled workman status and pay is blamed as the stumbling block.

AUTOMAKERS OPTIMISTIC ON STEEL SUPPLY—P. 120
Most companies are planning all-out car production in first months of 1953. Self-set goal is 1,250,000 cars next year. NPA has promised steel enough for 630,000 cars, has since added 1,480,000 tons of steel. Detroit feeling is that NPA will see steel a-plenty, then hand out more tickets.

of the WEEK in metalworking

ENGINEERING & PRODUCTION

RUSSIAN ALLOY TOOL STEELS WITH NITROGEN—P. 163
Use of nitrogen as an alloying element in special steels has practically doubled tool life under some conditions, Russian metallurgists claim. Nitrogen, which must be used with aluminum for best results, increases stability of austenite in annealed, quenched, and cold-worked high Cr high Ni steels.

BETTER FERRITIC STEEL SUBS FOR STAINLESS—P. 166
A ferritic steel containing approximately 13 pct Cr has proven suitable for service somewhat above 1000° F. Strengths compare favorably with austenitic stainless steels at 1000° F. High ductility is maintained at elevated and room temperatures after long periods of exposure.

METAL SHOW: TECHNICAL PROGRESS STORY—P. 170
Some 50,000 engineers and visitors attended the 34th National Metal Congress and Exposition held in Philadelphia Oct. 20 thru 24th. Technical meetings competed for visitors' time with hundreds of exhibits shown at Convention Hall. Twenty-three college alumni luncheons were held during the week.

GEAR DESIGN MODIFIED FOR BETTER SERVICE—P. 176
Life and efficiency of a gear train depends on design and manufacturing accuracy of individual gears. Design modifications possible on standard machines with standard cutters reduce excessive wear, increase tooth strength, minimize fatigue failure in gears.

BEARING RACES MACHINED AT HIGH SPEED—P. 180
To reduce the cost of machining bearing races, Hyatt Bearings Div. of General Motors Corp. turned to high velocity machining. Cutting speeds were raised from 200-275 to over 600 sfpm on an automatic lathe. High velocity required greater horsepower. Carbide cutting tools were used.

NEXT WEEK—METAL CLEANER EFFECTIVENESS STUDIED
Cleaners used in metal finishing operations are growing in complexity and number. A fatty acid soil, tagged with radioactive tracers, was used in cleaner tests. Radioactivity was measured with a Geiger counter before and after cleaning. The method, still a laboratory tool, is versatile, sensitive.

MARKETS & PRICES

IMPORTS OF MACHINE TOOLS HIT NEW PEAKS—P. 105
Imports of European machine tools into the U. S. have reached a new high in the first 8 months of 1952. Total dollar volume at the end of this period stood at $34 million. This compares with $13,703,655 for all of 1951 and $2,291,042 in 1950. But this represents orders placed 6 to 9 months ago.

INDIANA HARBOR MILL IS GROWING RAPIDLY—P. 106
Youngstown Sheet & Tube has kept an eye on metalworking expansion in the Chicago area. What they've seen justifies vast growth for Indiana Harbor plant. Mill will soon have annual capacity of 2.5 million ingot tons. New equipment includes eight openhearths, a blast furnace, a coke battery.

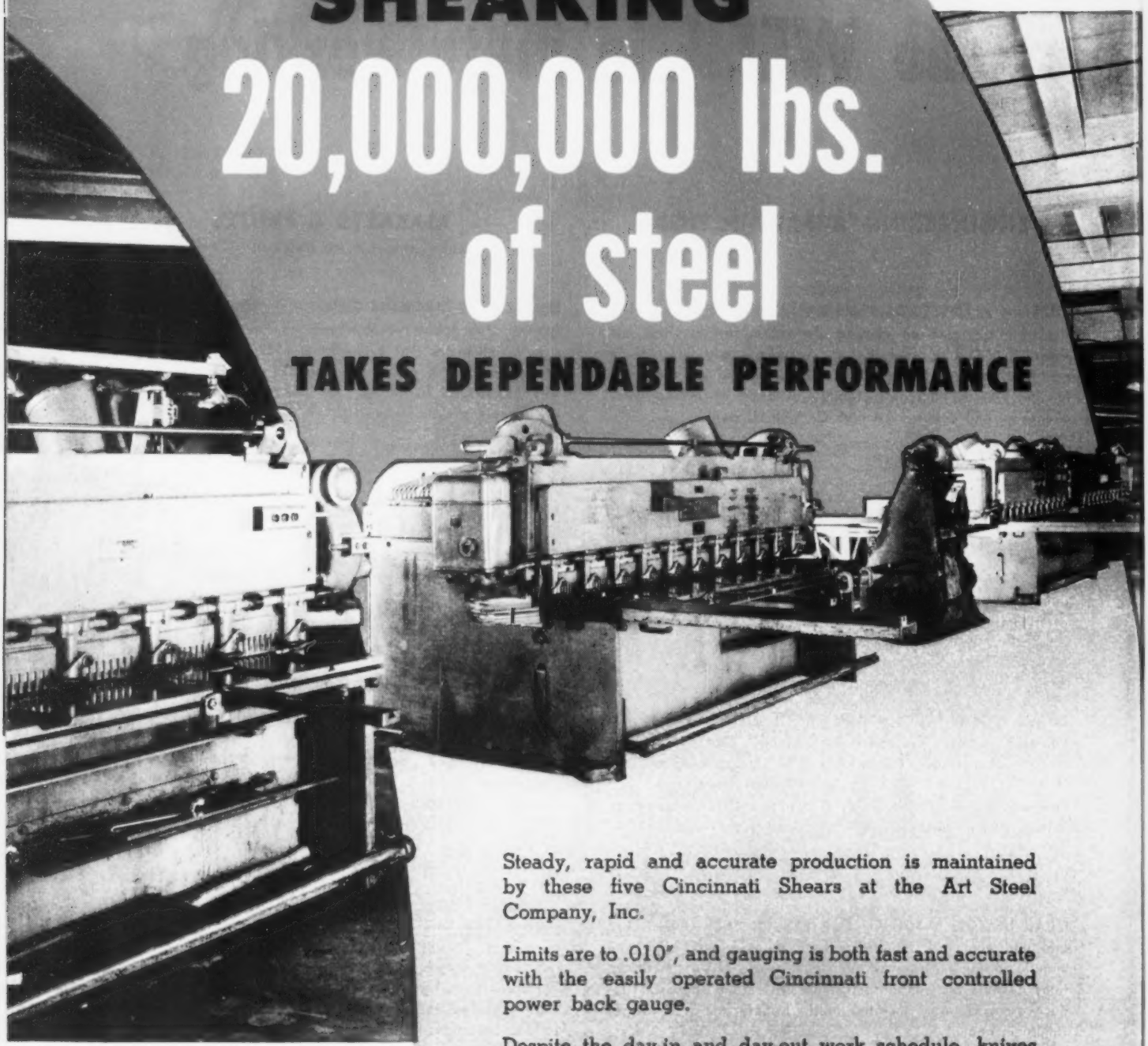
SEE ENOUGH STEEL FOR CONSUMER DURABLES—P. 115
Harry J. Holbrook, ending his tour as NPA durable goods boss, forecasts no serious shortage in first quarter and ample supply in second. He believes CMP can be dropped for durables as early as March— 3 months ahead of schedule. Anticipate heavier sheet and strip allocations in first quarter.

NON-RATED TOOL ORDERS BALLAST DEMAND—P. 131
New orders for machine tools dropped slightly in September, but the decline does not appear to be serious. The industry finds orders are holding up better than expected. Present levels are attributed to ability of builders to ship non-rated tool orders. Shipments hit a high for the year after vacation delays.

RECORD OUTPUT HASTENS STEEL DECONTROL—P. 229
Steel expansion and production are gaining by leaps and bounds. Gains are so spectacular and momentum so great the industry's fight for decontrol will climax earlier than had been expected. Steel leaders are pressing their advantage. And there is plenty of evidence to which consumers generally agree.

BRITAIN PUTTING ALUMINUM IN U. S. BANK—P. 232
Diversion of 22,000 tons of Canadian aluminum to U. S. plus deferment of repayment on previous loan will be a big help on this side of the Atlantic. It will also reduce the British surplus over normal inventory. Total aluminum debt reaches 49,500 tons, payable by 1955—or earlier.

SHEARING
20,000,000 lbs. of steel
TAKES DEPENDABLE PERFORMANCE



Photos—
Courtesy the Art Steel Co., Inc.,
New York, N. Y.

Steady, rapid and accurate production is maintained by these five Cincinnati Shears at the Art Steel Company, Inc.

Limits are to .010", and gauging is both fast and accurate with the easily operated Cincinnati front controlled power back gauge.

Despite the day-in and day-out work schedule, knives are sharpened but once a year.

Investigate these accurate, dependable Cincinnati Shears—you will find them profitable in your shop. Remember, straight-edged square blanks, accurate to size, are produced at low cost on these modern Cincinnati Shears.

Write for Shear Catalog S-6.

THE CINCINNATI SHAPER CO.

CINCINNATI 25, OHIO, U.S.A. SHAPERS • SHEARS • BRAKES

CINCINNATI

Fir

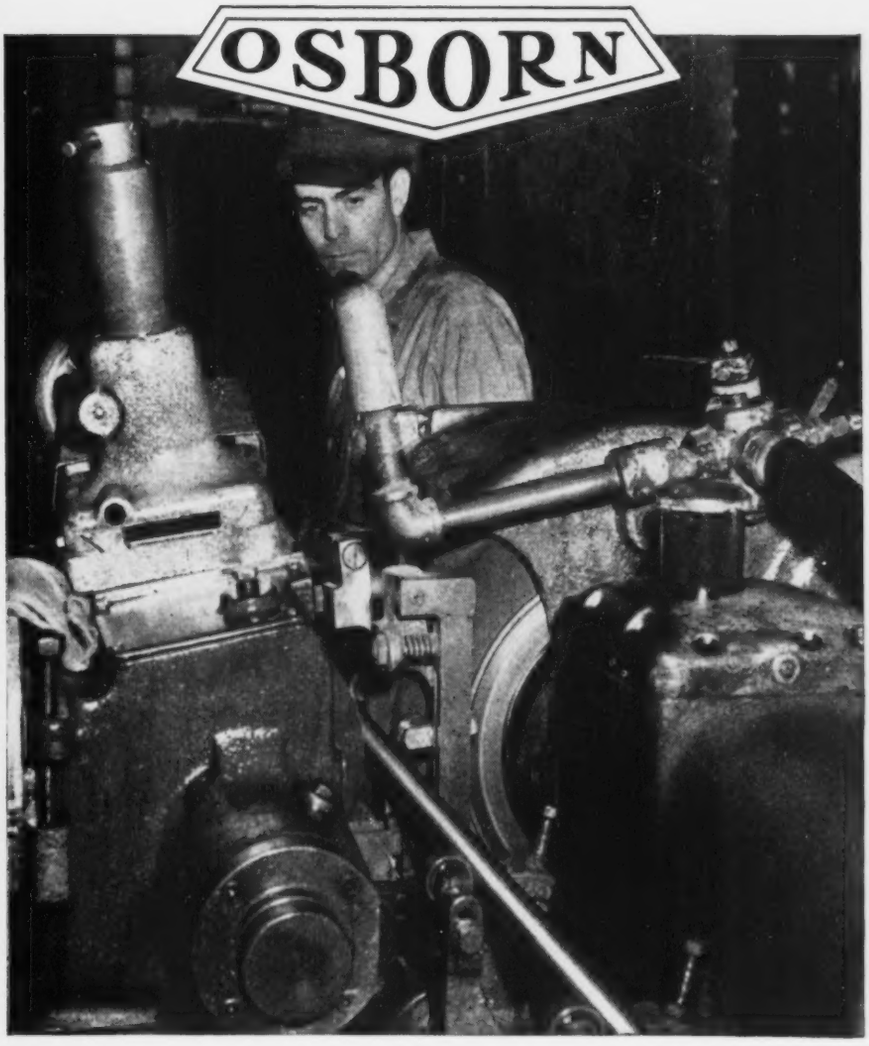
tolera
smoo

In
being
mach
takin
Cente
packi

A
your
today
Aven

OSBOR

Nove



Finer finish . . . longer product life with Centerless Brushing

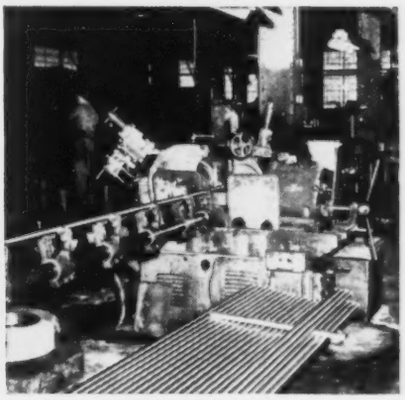
This machine does double duty. For removal of metal to close tolerance, it is a *centerless grinder.* Then, for finishing the surface to micro-smoothness it is a *centerless brusher.* Its conversion takes only a few minutes.

In the operation shown above, nickel-moly steel rods for pumps, are being finished by an Osborn Fascut Brush. Prior to brushing, the same machine with a grinding wheel in place of the brush made a rough grind, taking off .006 inch, and a finish grind, taking off .002 inch. Results of the Centerless Brushing: Produces a smoother finish. Reduces wear in pump packing. Reduces corrosive action on rods; makes them last longer.

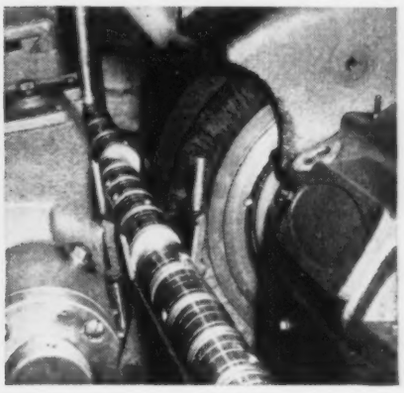
An **O**sborn **B**rushing **A**nalyst helped develop this improvement. Ask your **OBA** to help *you* on all problems of cleaning and finishing! Call him today or write *The Osborn Manufacturing Company, Dept. 865, 5401 Hamilton Avenue, Cleveland 14, Ohio.*

Osborn Brushes

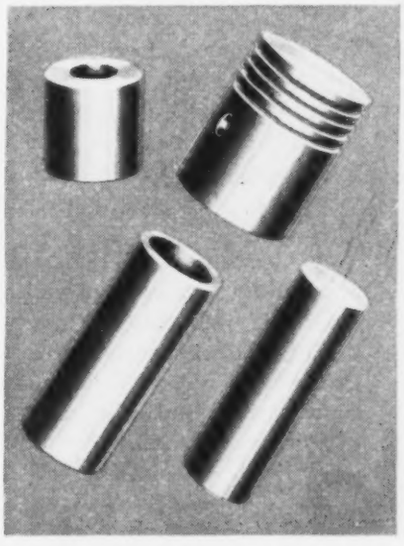
OSBORN POWER, MAINTENANCE AND PAINT BRUSHES AND FOUNDRY MOLDING MACHINES



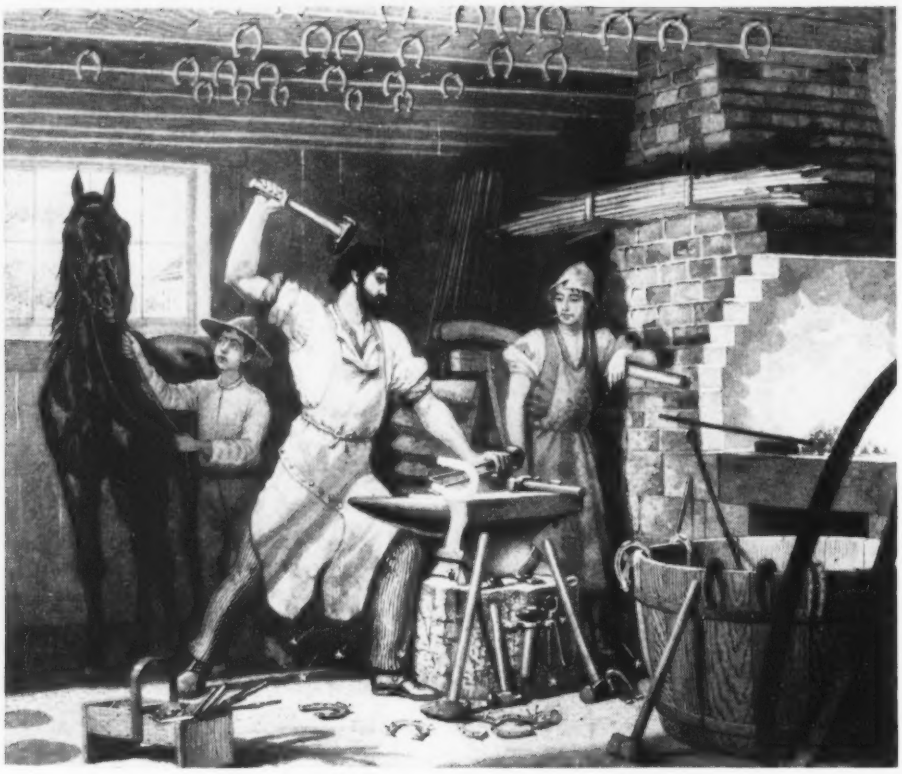
THE SET-UP. This shows the centerless grinding machine which also serves as a "centerless brusher". These pump rods vary from 1⅛ in. to 1½ in. diameter . . . from 6 ft. to 36 ft. in length. Regulating wheel speed is 52 r.p.m.



ANOTHER JOB. Here Centerless Brushing finishes cast iron pistons to micro-smoothness. Simplifies assembly operations and increases life of pistons and cylinders. Output of this machine is 10,000 pieces per 8 hours.



TYPICAL PARTS which are being improved by Centerless Brushing include pistons, piston pins, bushings, tubing . . . any cylindrical parts. It can be applied to many sizes of parts and types of material on a mass production basis.



From the Beale Collection of Early Americana

Horseshoe Iron...to Aircraft Steel

Ryerson Completes 110 Years of Service

When Joseph Ryerson opened his first small iron store, 110 years ago, the clang of the blacksmith's anvil was a dominant note in America's metalworking industry. Blacksmiths, boiler makers and other metalworking pioneers were the iron store's first customers. Their orders for horseshoe and boiler iron, axles, plow steel, spikes, etc. formed the basis of our business.

Today that small iron store has grown to be the world's largest steel service organization with fifteen great plants strategically located across the nation.

On the occasion of our 110th Anniversary, we are grateful for our thousands of customers whose orders through the years testify to the Ryerson tradition of trustworthy service. And we are thankful for the privilege of living and working in a free country where initiative and service are rewarded.

From your nearby Ryerson steel plant flows every kind of steel in every shape and size to meet the needs of industry. Ryerson shipments cover everything from structural shapes and plates of carbon steel and bright sheets of stainless to high strength aircraft-quality alloys.

When you need steel, any kind, any quantity, cut to order and delivered promptly we will be pleased to have you call us.

PRINCIPAL PRODUCTS IN STOCK

CARBON STEEL BARS—Hot rolled and cold finished

STRUCTURALS—Channels, angles, beams, etc.

PLATES—Many types including Inland 4-Way Safety Plate

SHEETS—Hot and cold rolled, many types and coatings

TUBING—Seamless and welded, mechanical and boiler tubes

ALLOYS—Hot rolled, cold finished, heat treated. Tool steel.

STAINLESS—Allegheny bars, plates, sheets, tubes, etc.

REINFORCING STEEL—Bars and accessories, wire mesh, etc.

BABBIT METAL—Lead base.

RYERTEX—Plastic bearing.

MACHINERY & TOOLS—Metal fabrication

RYERSON STEEL

JOSEPH T. RYERSON & SON, INC. PLANTS AT: NEW YORK • BOSTON • PHILADELPHIA • CINCINNATI • CLEVELAND • DETROIT PITTSBURGH • BUFFALO • CHICAGO • MILWAUKEE • ST. LOUIS • LOS ANGELES • SAN FRANCISCO • SPOKANE • SEATTLE

THE IRON AGE

Editorial, Advertising and Circulation Offices, 100 E. 42nd St., N. Y. 17, N. Y. Murray Hill 5-8600

GEORGE T. HOOK, Publisher
TOM C. CAMPBELL, Editor

EDITORIAL STAFF

Managing Editor George F. Sullivan
Technical Editor Darwyn I. Brown
News-Markets Editor Wm. V. Packard
Asst. Technical Editor W. G. Patton
Machinery Editor E. C. Beaudet
Asst. News Editor Theodore Metaxas
Associate Editors: H. W. Van Camp, F. J. Winters, R. L. Hatschek, W. B. Olson, G. G. Carr; Assistant Editors: E. C. Kellogg, J. J. Obrzut; Art Director: Carl Cerminaro; Regional Editors: K. W. Bennett, Chicago; R. D. Raddant, Detroit; Robert M. Lorz, Cleveland; J. B. Delaney, Pittsburgh; T. M. Rohan, San Francisco; G. H. Baker, A. K. Rannells, R. M. Stroupe, Washington; Editorial Assistants: L. Brass, M. Perrone, C. M. Markart; Correspondents: F. L. Allen, Birmingham; N. Levenson, Boston; R. M. Edmonds, St. Louis; James Douglas, Seattle; Jack Adams, Los Angeles; F. Sanderson, Toronto; F. H. Harley, London, England; Chilton Editorial Board: Paul Wooton, Washington.

BUSINESS STAFF

CHARLES R. LIPPOLD
Director of Advertising Sales

Production Manager B. H. Hayes
Director of Research Oliver Johnson
Circulation Mgr. William M. Coffey
Promotion Manager James A. Crites
Asst. Dir. of Research Wm. Laimbeer

REGIONAL BUSINESS MANAGERS

Chicago 3.....Stanley J. Smith
10 S. LaSalle St. Franklin 2-0203
Cleveland 14.....Charles R. Lippold
1016 National City Bank Bldg., Main 1-2263
Columbus 9, Ohio.....Harry G. Mumm
1849 Franklin Park South, Evergreen 9245
Detroit 2.....Peirce Lewis
103 Pallister Ave Trinity 1-3120
Los Angeles 28.....R. Raymond Kay
2420 Cheremoya Ave. Granite 0741
New York 17....C. H. Ober, C. T. Post
100 E. 42nd St. Murray Hill 5-8600
Philadelphia 39.....B. L. Herman
56th & Chestnut Sts. Granite 4-5600
Pittsburgh 22.....J. M. Spackman
814 Park Bldg. Atlantic 1-1831
W. Hartford 7.....Paul Bachman
62 LaSalle Rd. Hartford 32-0486

OTHER EDITORIAL OFFICES

San Francisco 3, Cal.. 1355 Market St.
Washington 4.....National Press Bldg.

Circulation Representatives: Thomas Scott, James Richardson.

One of the Publications Owned and Published by Chilton Co., Inc., Chestnut & 56th Sts., Philadelphia 39, Pa.

OFFICERS AND DIRECTORS

JOS. S. HILDRETH, President

Vice-Presidents: Everit B. Terhune, P. M. Fahrendorf, G. C. Buzby, Harry V. Duffy; William H. Vallar, Treasurer; John Blair Moffett, Secretary; George T. Hook, Maurice E. Cox, Tom C. Campbell, Frank P. Tighe, L. V. Rowlands, Directors.
George Maiswinkle, Asst. Treasurer.

Indexed in the Industrial Arts Index and the Engineering Index.

Society of Business Magazine Editors

Controlled Circulation Audit

National Business Publications

Copyright, 1952, by Chilton Co. (Inc.)

The Customer Is Back

DID you ever try to open a catsup bottle, equipped with the slick suction-like cap? What did you use? A crow bar, a shoehorn, a can opener or the back of a knife? Or did you go berserk and break the neck of the bottle?

Are you one of those fellows with a mania for pickles at midnight? If you got your pickles in a screw-top jar, this is not for you. But if you had one of those bottles with a pry-off top—shall we go on? What did you use? Dynamite, your shoe, a boy scout knife or did you drop the bottle on the floor and pick up the pickles?

Perhaps you are a jelly eater or a peanut butter user. Have you ever been able to get the top back on the jar? Or did it drop down among the leftovers in the refrigerator?

These are small things but they are disturbing. Maybe they did not get you as mad as buying something without an instruction sheet —or one you needed an M. E. degree to follow. You might have gotten madder when you tried to buy something specific only to have a disinterested clerk say, "Here is something just as good."

You just had to take a lot of things as well as you could, swearing that the day would come! Well, it is here.

The customer is back. He has money, but he holds on to it as though it were an all-day sucker at the circus. You have to sell him, plead with him, show him and then humor him to get a cent out of him.

What's new about this? Nothing much because the customer usually keeps the manufacturer on his toes. For years, though, he has had to take what he could get. Many manufacturers are just as far away from the ultimate user of their products as some of the catsup bottlers, the jelly makers, the peanut butter vendors and the pickle suppliers.

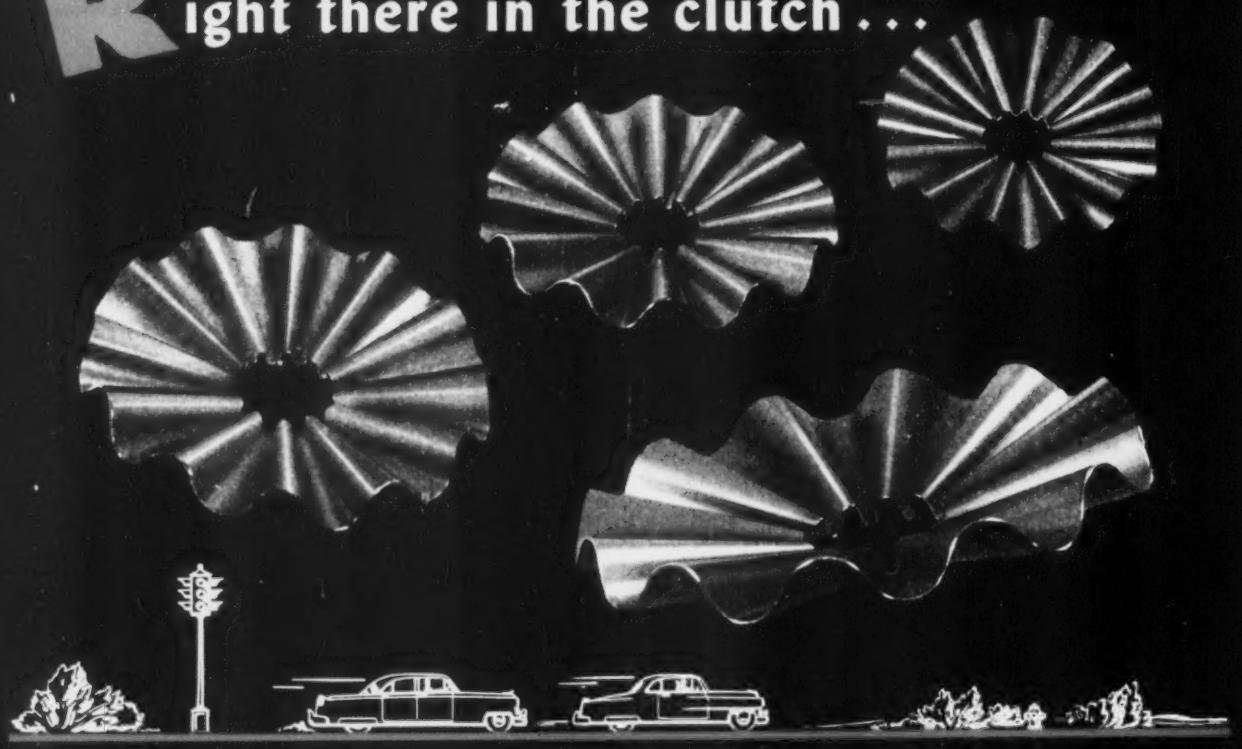
If some manufacturers and sellers were to sit down and use their own products or try to follow some of their own directions they would have a fresher idea of who is final boss.

The customer is back and the realistic businessman and industrialist is really glad in his heart. Now a lot of us will have to get up off our polished seats and realize that customers are people—not robots operated by punch holes and machines.

Tom Campbell

Editor

Right there in the clutch...



SHARON* HI-STRENGTH STEELS ADD LIFE TO HARD WORKING AUTOMOBILE CLUTCHES

Those who work with them call them "lamp-shades." Actually they are clutch springs—part of the standard clutch of the modern automobile.

This particular spring is precision built of Sharon Hi-Strength steel to deliver maintenance-free performance for the life of the car. Production line fabrication of these pieces requires steel of consistent uniformity and analysis.

Like so many manufacturers of high quality steel products, the makers of this important part have learned they can rely on Sharon for consistent quality.

***Specialists in STAINLESS, ALLOY, COLD ROLLED and COATED Strip Steels.**

SHARON STEEL CORPORATION

Sharon, Pennsylvania

DISTRICT SALES OFFICES: CHICAGO, ILL., CINCINNATI, O., CLEVELAND, O., DAYTON, O., DETROIT, MICH., INDIANAPOLIS, IND., MILWAUKEE, WIS., NEW YORK, N. Y., PHILADELPHIA, PENNA., ROCHESTER, N. Y., LOS ANGELES, CALIF., SAN FRANCISCO, CALIF., MONTREAL, QUE., TORONTO, ONT.

For information on Titanium contact Mallory-Sharon Titanium Corp., Niles, Ohio

SHARONSTEEL

Dear Editor:

Letters from readers

Can You Help?

Sir:

We represent several steel mills in Belgium and a problem has developed for which we require assistance.

One of the mills requires 25,000 to 30,000 tons of land pebble rock phosphate, metallurgical grade, for use in a blast furnace.

We have contacted the major producers of this material but find that the granular size of the domestic material, on the whole, is too small. The largest granular size we can obtain is 90 pct plus 5/32 in. with nothing over ¾ in. The mill claims it has been getting this material from Russia and the granular size runs 90 pct, 25 to 100 mm, with lumps as large as 400 mm. From our investigations, we are prepared to deduce that large size lump rock phosphate is not available in this country.

We would greatly appreciate any information you can give us, especially as to possible sources of supply.

M. HIRSCH
Vice-President

Chemical Div. of
Belgian American Mercantile Corp.
New York

Perhaps one of our readers may be able to help you.—Ed.

Materials Handling

Sir:

In your Oct. 16 issue, p. 41, you have an article on "Equipment: How to Move Materials." We feel that the description on mobile cranes is restricted to one particular type and does not at all do justice to this category of M-H equipment.

The introduction, "A blood relative of the original fork-truck-with-crane-attachment is the mobile crane," surely is misleading. The mobile crane antedates the fork lift truck which is a comparatively recent M-H innovation. The fork lift truck is a development of the high and low lift platform trucks and its extensive use during the war period brought about the introduction of numerous accessories of which the crane attachment is one.

The reader gets the impression that the top capacity of these cranes is 10,000 lb, greatest boom elevation is 19 ft and that "the boom must be locked in one of five positions before the hoist is begun." My client, Silent Hoist & Crane Co. makes the "Krane Kar," a swing-boom mobile crane with boom reach up to 37 ft, capacity of 1½, 2½, 5 and 10 tons.

Silent Hoist also manufactures the "Karri-Go" front-boom crane in capacities of 10,000 and 15,000 lb. The boom is available with power-topping so that the operator may achieve innumerable positions shifting the boom up or down in increments of 1/16 of an inch, with full load on the hook.

H. HURST

Harry Hurst Advertising
New York

Cerium

Sir:

In your issue of Oct. 9 you had an interesting and instructive article on cerium (p. 288) and you listed the suppliers. Could you furnish me with a list of just the producers?

W. H. NORRIS

Pittsburgh

The producers of cerium are: Cerium Metals, Inc., 153 Waverly Place, New York, N. Y.; General Cerium Co., 1032 River Road, Edgewater, N. J.; New Process Co. 48 Center St., Newark, N. J.; American Metallurgical Products Co., 3600 Forbes St., Pittsburgh, Pa.; and Matchless Metals Co., 154 Barclay Ave., Flushing, N. Y.—Ed.

Titanium Parts

Sir:

Permit me to take issue with your statement on p. 270 of your Oct. 9 issue, saying that "Punch press is not generally recommended for titanium parts. Forming temperatures of at least 800°F are necessary. . . ."

For your information, I am enclosing our bulletin "Pioneering the Deep Drawing of Titanium." Titanium can be cold-drawn, at least in commercially pure form. When it comes to stretching, such as involved in a shallow plate, we did find a little heating helpful.

Our problem is less one of fabrication than it is of finding applications for cold-drawn parts.

C. C. HIGGINS
President

Worcester Pressed Steel Co.
Worcester

Predictions

Sir:

On the Newsfront page of the Oct. 16 issue there was a short paragraph about a steel capacity study for 1960.

There are some interesting points to this prediction and I wonder if you could tell me who made it. I would like to write the author for more information.

J. T. ANDERSON
Mgr., Commercial Research Dept.

Armco Steel Corp.
Middletown, Ohio

For more details write to A. Harris, Pittsburgh Steel Co., Grant Bldg., Pittsburgh. —Ed.

Which kind of Cold Rolled Strip Steel is best for You ?

CONSIDER SHEET COIL

—if variations in physical characteristics are permissible.
—if fairly heavy oversize gauge variations are not objectionable.
—if the fabricating operations are not too complicated and do not require intricate expensive dies.
—if a fine surface finish is not essential.
—if a good base for paint or enamel is desired.
—if you do not object to some "square footage" loss due to oversize variation.
—then Sheet Coil will probably be the most economical material for the job.

CONSIDER THINSTEEL

—if you must have a high degree of uniformity of chemistry and physical properties—and precision gauge tolerances.
—if you wish to keep die wear low, no oversize gauge variations.
—if you require a fine finish or a better base for plating.
—if you want maximum yield for "most finished parts per ton."
—if you want selected tempers for maximum strength and lightest weight.
—then you'll find Thinsteel the most economical material by far.

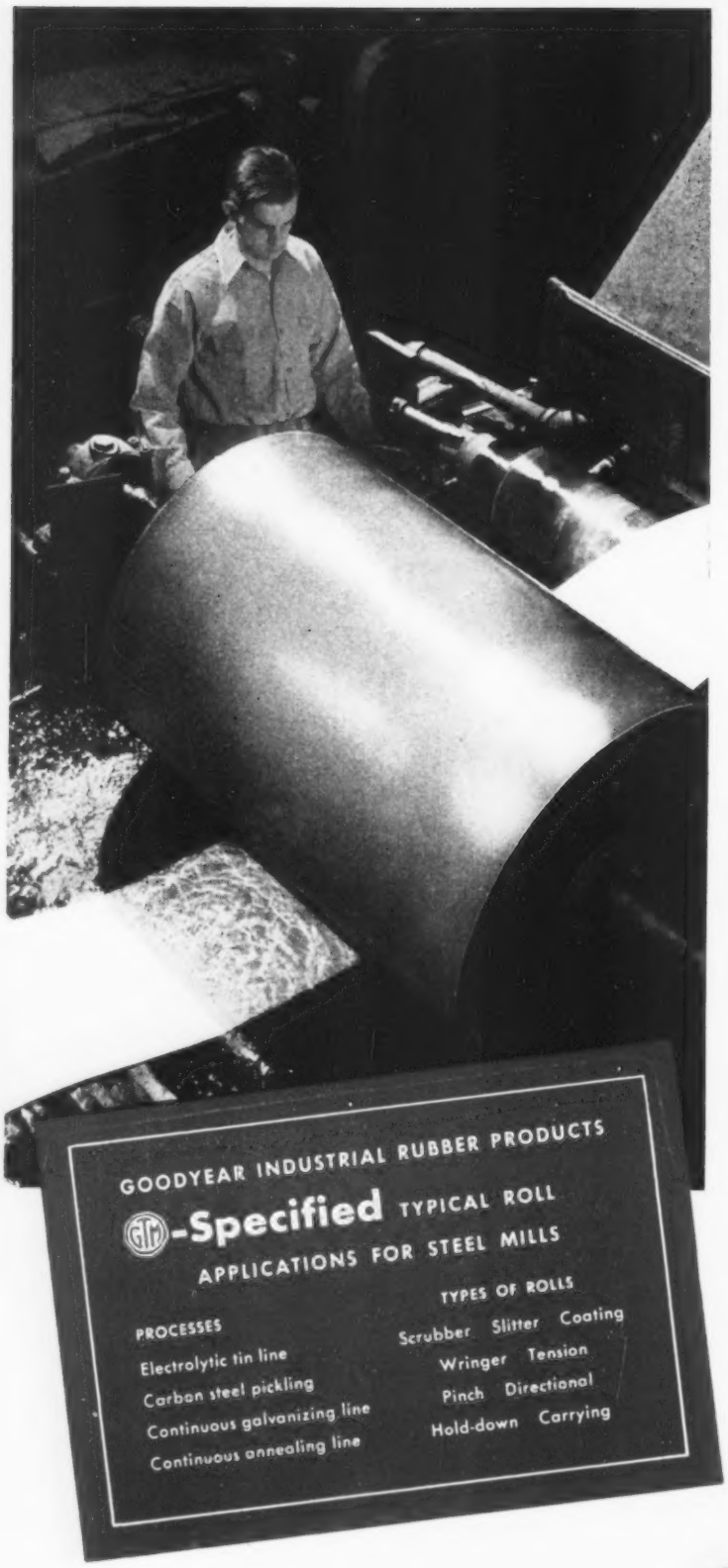
You can always count on Kenilworth helping you get the right steel for your requirements. Order Sheet Coil or Thinsteel and notice that each coil carries an identifying tag as pictured above. Call on Kenilworth, too, for your needs in Stainless Sheets or flat rolled Spring Steels (Annealed or hardened and tempered).

THE Kenilworth Steel co.

750 BOULEVARD,
KENILWORTH, NEW JERSEY

SPECIALISTS IN FLAT ROLLED METAL PRODUCTS

Telephones: N. Y. COrtlandt 7-2427
N. J. UNionville 2-6900
Teletype: Roselle, N. J., 387



They rolled away their troubles on this strip pickling line

ON this continuous steel cleaning line—combining shot blast cleaning and pickling—stainless steel strip is passed along over and under rubber covered rolls specified by the G.T.M.—Goodyear Technical Man.

During processing, the steel strip undergoes shot blasting, as well as pickling in 16% sulphuric acid at 185°-190° and 12% nitric-hydrofluoric acid at 150°. The rubber hold-down and carrying rolls rotate in these acid solutions.

Special rubber compounds, specified by the G.T.M., are built into the roll covering to resist this heat and acid action. Result is longer life and more trouble-free service.

Goodyear's rubber rolls resist heat, chemicals, oil, abrasion, or other roll-killing conditions. Each covering is tailor-made to make the roll function as designed. "Superbonding" process permanently bonds rubber covering to the metal core.

Why not discuss *your* roll requirements with the G.T.M. now? You can reach him by writing Goodyear, Mechanical Goods Division, Akron 16, Ohio.

LOOK FOR YOUR GOODYEAR INDUSTRIAL RUBBER PRODUCTS DISTRIBUTOR *in the Yellow Pages of Your Telephone Directory under "Rubber Products" or "Rubber Goods." He handles Hose, Flat Belts, V-Belts, Molded Goods, Packing, Tank Lining, Rubber-Covered Rolls built to the world's highest standard of quality.*

GOODYEAR

THE GREATEST NAME IN RUBBER

We think you'll like "THE GREATEST STORY EVER TOLD"—Every Sunday—ABC Network

Fatigue Cracks

by William M. Coffey

Philadelphia, 1952

After clearing the cobwebs from the skull and routing a regiment of cavalry that has been using our mouth for a bivouac area, a few vivid impressions still remain of our very first Metal Show: The taxi drivers, the souvenir-looters and a charming hostess at a dining place called, aptly enough, The Forge.

Long conditioned to the calloused tribe of NYC cab drivers, we were shocked and mortified by the treasonous conduct of the Philly cabbies. On two different occasions our man actually got out of the car and *opened the door.* Call out the Marines, Joe McCarthy and the F. B. I.!

Of course thousands of children must confuse the Show with Xmas for look what Daddy brings home! Canes, piggy banks, building blocks, picture books, marbles. We came back loaded with loot and can report most of our shopping is done, 65 days ahead of time . . . .

. . . and that hostess! Blond, pert and witty (just like the wife, dear) and The Forge service! We quote from the menu "Take home what you can't eat. It is the policy of The Forge to provide generous portions of the finest meats—more than our patrons can eat. It's all yours—and much too good to leave behind. Just ask the hostess to 'wrap the leavings.'" We asked, but she had to get home to mother.

Then we remembered talking to a man who sells executive desks. Was trying to unload his number one item. It has a built-in refrigerator, radio, electrically-controlled, push-button drawers, fluorescent lighting from beneath—and every other gadget you could think of. Price $7,000. If we want a Yacht, we'll ask for a Yacht.

We're proud to say, too, that we didn't once go out of our way to see the Magic Tunnel, the place that was so closely guarded by those long-stemmed girls. We didn't have to. It was in the direct path between your f.f.j's booth and a water fountain.

Note to The Boss: Of course that's not *all* we came from the Metal Show with. We came back with a cold, too. Note to The Readers: All technical reporting is left to the editorial staff.

Ivanhoe Rides Again

The Caterpillar tractor people have come up with a brand new way to bag elephants. An angry young bull elephant in Ceylon, enraged when a new-type Caterpillar tractor threatened his herd, charged the tractor. The operator lowered the dozer and charged, himself. The winner in the first charge: the bulldozer. The elephant was instantly killed. Required safari equipment: one bulldozer.

Psychosomatic Forging

A couple of years ago a roving IRON AGE editor came upon a most unusual machine in a New England plant. What it did was hold a stainless steel bar in mid air and smash it between a pair of dies that approached from right and left at high speed—like a head-on collision.

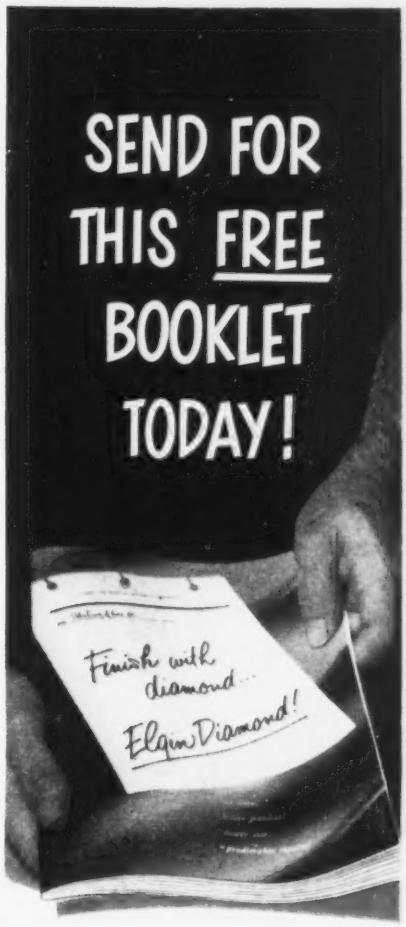
By the time we got through to checking with the manufacturer—Chambersburg Engineering — the Air Force had moved in and clamped down the usual secrecy. But the wraps were taken off late last month and two units demonstrated. The Chambersburg people still don't know much about why the metal behaves as it does so they asked some metallurgical brains for their opinions. One spent an entire summer trying unsuccessfully to set up an equation for an electronic computer.

But he did venture a prediction. He told them that if they kept on moving the dies together faster and faster there was a good possibility that they'd be able to scare the metal into position without even touching it. He cautioned that this was unlikely in our lifetime but the possibility was there. Our man on the scene labeled it psychosomatic forging and we'll have our children keep track of it for you.

Puzzles

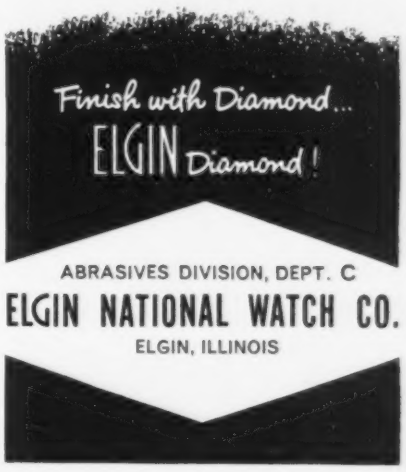
Add these distinguees to the winners of the numbers problem: F. L. Barrows, Nash-Kelvinator; I. J. Chamberlain, Western Electric; Davis S. Tarr, Tarrcraft Co.; Peter T. Howard, International Business Machines Corp.

Throw away the pencils, boys, for here's a puzzle tossed out by J. J. Reich, Reich-Huntington Iron Works and it's a problem of deduction. Mr. Reich says no pencils allowed, so anyone using a pencil is simply disqualified: Which is greater, smaller or equal? The circumference of a 10 ft diameter circle or the circumference of two five foot circles?



Here's a way to save time and improve finish quality

See why diamond is the fastest cutting of all abrasives . . . and why Elgin Diamond is the fastest cutting of all diamond abrasives. Illustrations and specfic data on plastic mold polishing, drawing die finishing, tool and gage lapping and mass production polishing of component parts will help you solve your own finishing problems. Write for your copy now . . . ask for a free demonstration in your own shop to prove how you will save when you . . .



ABRASIVES DIVISION, DEPT. C
ELGIN NATIONAL WATCH CO.
ELGIN, ILLINOIS

FOR SUPERIOR Coatings

think first of the coatings that last!

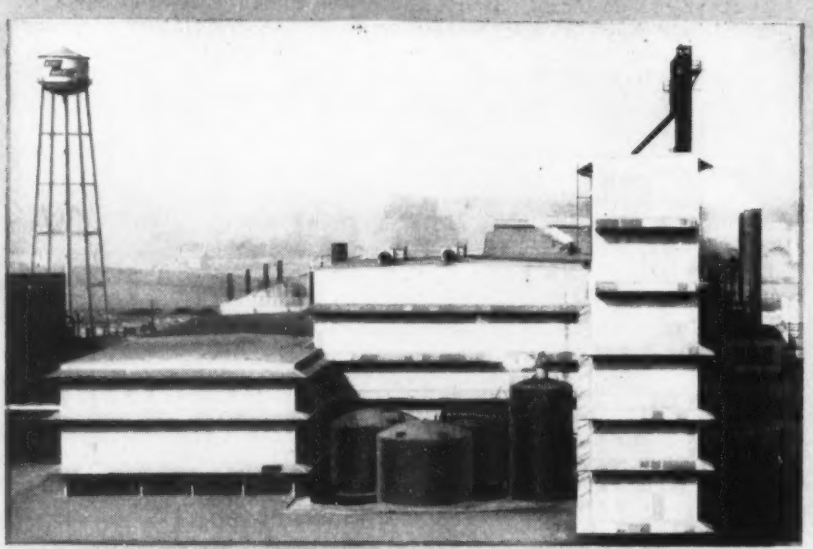
INSUL-MASTIC

Corrosive conditions in paper pulp mills and steel mills are terrific. The atmosphere in these plants is charged with acids and alkalis that eat the heart out of steel in a few years—or even a few months. INSUL-MASTIC *superior* COATINGS are giving protection that will last for years to this costly metal equipment in these extremely corrosive places.

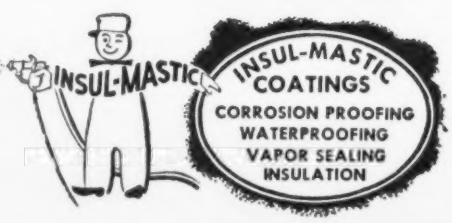
In other industries also, Insul-Mastic Gilsonite Coatings are being specified because of their resistance to chemicals and moisture vapor; their minimum shrinkage and great temperature range.

For long coating life under severe conditions specify INSUL-MASTIC *superior* Coatings.

ST. REGIS PAPER CO., *by using Insul-Mastic Type "D", the Coating that Insulates and Protects,* will prevent up to 65% of heat loss from these black liquor tanks and foam tank. Many other vessels throughout this modern new mill at Pensacola, Florida are coated with Insul-Mastic for corrosion prevention as well as insulation.



Insul-Mastic Corporation
OF AMERICA
1168 OLIVER BUILDING · PITTSBURGH 22, PA.
Representatives in Principal Cities



Conventions & Meetings

Nov. 5-9—Scientific Apparatus Makers Assn., mid-year meeting, The Homestead, Hot Springs, Va. Association headquarters are at 20 N. Wacker Drive, Chicago.

Nov. 6-7—Society of Automotive Engineers, Inc., National Fuels & Lubricants, Meeting, The Mayo, Tulsa, Oklahoma. Society headquarters are at 29 W. 39th St., New York.

Nov. 10—Standards Engineers Society, fall meeting, Engineers Club, Philadelphia. Society headquarters are at 1760 Hillcrest Ave., Merchantville, N. J.

Nov. 10-11—Magnesium Assn., annual meeting, Hotel Biltmore, New York. Headquarters are at 122 E. 42nd St., New York.

Nov. 10-13—National Electrical Manufacturers Assn., semi-annual meeting, Haddon Hall Hotel, Atlantic City, N. J. Association headquarters are at 155 E. 44th St., New York.

Nov. 10-14—Wire Assn., annual convention, Cleveland. Association headquarters are at 300 Main St., Stamford, Conn.

Nov. 13-14—National Constructors Assn., Labor Committee and Executive Committee, Hotel Roosevelt, New Orleans. Association headquarters are at 50 E. 41st St., New York.

Nov. 19—American Mining Congress, Coal Division Conference, Pittsburgh. Society headquarters are at 1200 18th St., Washington.

Nov. 19-21—American Management Assn., Finance Conference, Hotel Roosevelt, New York. Association headquarters are at 330 W. 42nd St., New York.

Nov. 20-21—American Society for Quality Control, mid-West Conference, Claypool Hotel, Indianapolis.

Nov. 21—Malleable Founders Society, Western Section meeting, The Drake, Chicago. Society headquarters are at Union Commerce Bldg., Cleveland.

Nov. 28-30—Grinding Wheel Institute, annual meeting, Hotel Statler, Buffalo. Association headquarters, P. O. Box 64, Greendale, Mass.

Nov. 30-Dec. 5—American Society of Mechanical Engineers, annual meeting, Statler Hotel, New York. Society headquarters are at 29 W. 39th St., New York.

Dec. 2—National Warm Air Register Manufacturers Institute, annual meeting, Cincinnati. Institute headquarters are at 5 E. Long St., Columbus, Ohio.

Dec. 2—Spring Manufacturers Assn., annual meeting, Biltmore Hotel, New York. Association headquarters are at 249 Main St., Bristol, Conn.

Dec. 2—Society of Automotive Engineers, Inc., Hotel Statler, New York. Society headquarters are at 29 W. 39th St., New York.

Dec. 3-4—National Warm Air Heating & Air Conditioning Assn., annual convention, Sheraton-Gibson Hotel, Cincinnati. Association headquarters are at 145 Public Square, Cleveland.

Made Especially for Fast Gaging of Sheet Iron and Steel

For Hot or Cold Sheets

MODEL 644

This gage automatically positions itself perpendicular to sheet to assure quick, accurate measurement of sheet and strip stock. Model 644 has many uses besides use on hot sheets such as — gaging material in receiving room to confirm size delivered, checking thickness of material drawn from stock room for manufacturing, and determining thickness of plating by measuring stock before and after plating operation. Furnished with direct or continuous reading dial, depending on use of gage.

For Irregular Shapes

MODEL 49

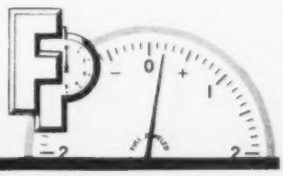
(Model 149 for Inside Dimensions—not illustrated)

This caliper-type indicating gage is among the most popular gaging instruments in use today. Fast, handy, and convenient, Model 49 checks the outside dimensions or thickness of many articles where the tolerances are not exceedingly close. Patterns, cores, castings, forgings, plastics, dies, glass bottles, sheet material are but a few of hundreds of parts checked by this gage. Two stock models are available but specially shaped jaws and various sizes will be made to suit your needs. Send prints or samples of work for designs and prices.

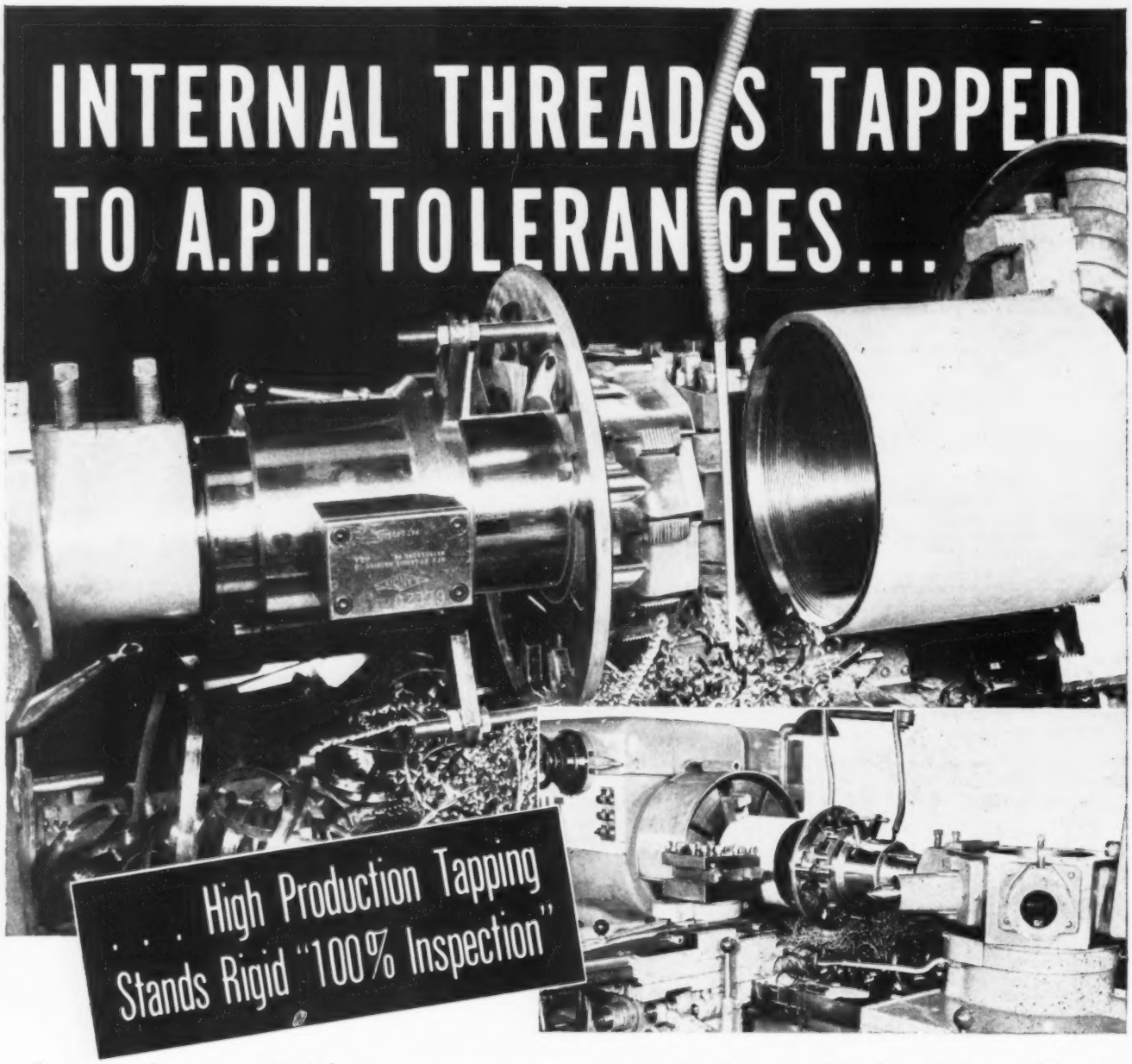
Tell us your gaging requirements and we will recommend a gage to tell you what you want to know. Federal Products Corp., 1311 Eddy Street, Providence 1, R. I.

FEDERAL

Largest manufacturer devoted exclusively to designing and manufacturing *all types* of DIMENSIONAL INDICATING GAGES



INTERNAL THREADS TAPPED TO A.P.I. TOLERANCES...



. . . High Production Tapping Stands Rigid "100% Inspection"

Casing couplings are subjected to enormous strains created by the weight of the suspended casing, as well as to tremendous internal and external pressures. For these reasons they require threads of extreme accuracy. Thus the prime consideration in the selection of equipment for the production of these threads is that it produce A.P.I. threads at economical production rates.

The operation shown here is one of many where internal tapered threads are cut to A.P.I. tolerances at high production rates by Landis LL Receding Collapsible Taps. 8 pitch round form threads are cut in Grade N80 casing couplings $10\frac{3}{4}$" in diameter to a length of 4" with a $\frac{3}{4}$" taper. Production is high—averaging consistently about 17 surface feet per minute. A.P.I. tolerances are met without difficulty.

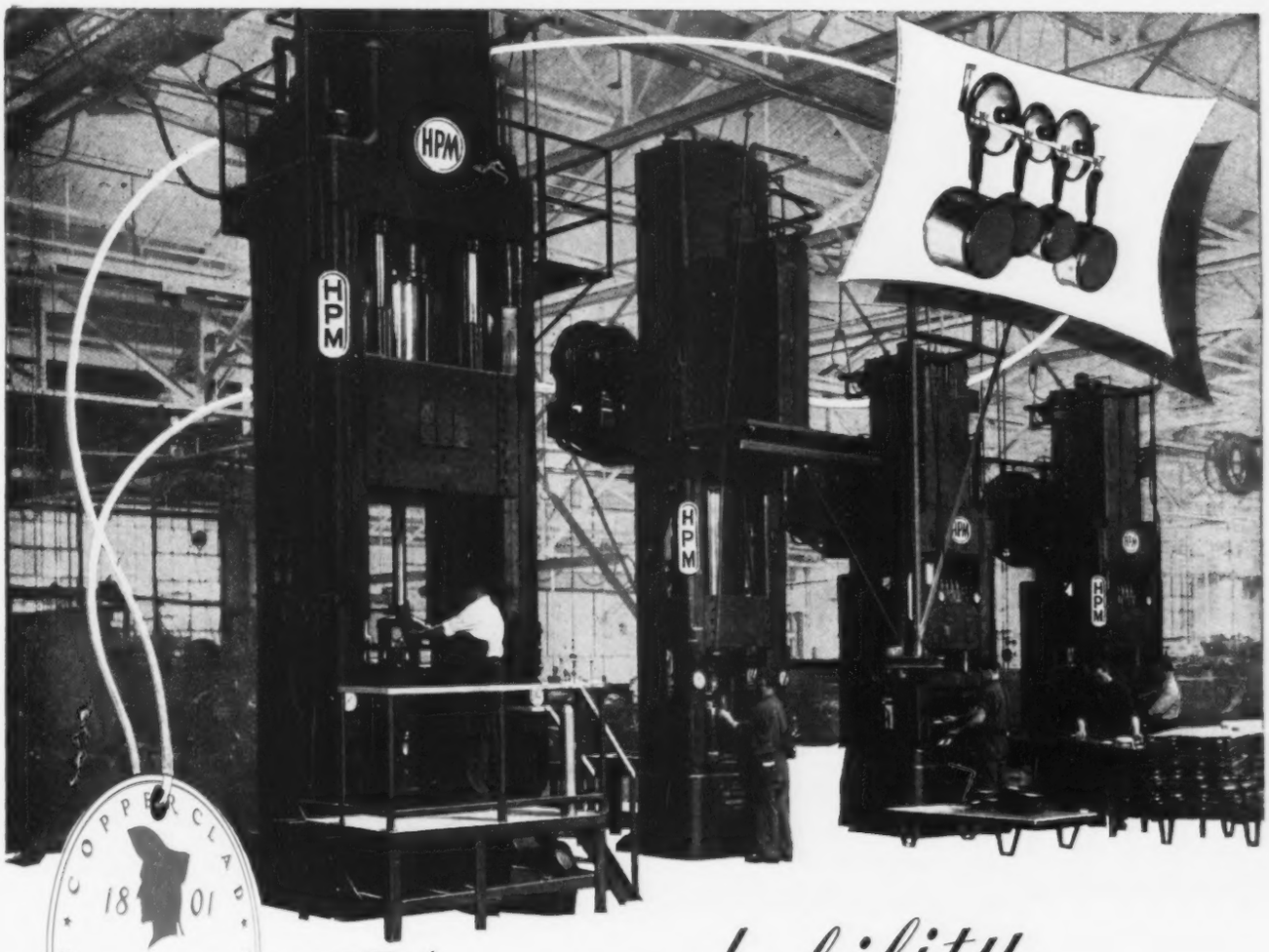
Landis LL Receding Collapsible Taps are designed and built for this type of work. The receding mechanism causes the chasers to recede into the tap head automatically at a rate equal to the taper of the thread being cut. When the thread is completed the chasers collapse into the tap head, and the tap is withdrawn.

Each tap has a wide range of cutting diameters since the tap heads are detachable and interchangeable. For example, if furnished with appropriate heads, the 6LL Tap Body, shown here equipped with a 10" ALM Tap Head will cut threads in all pipe sizes ranging from 6" to 12" inclusive. The Style LL Tap Body is made in four sizes to cover a range of nominal pipe sizes from 1" to 12" inclusive.

Write for Bulletin G-95

LANDIS STYLE LL RECEDING COLLAPSIBLE TAP

LANDIS *Machine* COMPANY · WAYNESBORO PENNSYLVANIA



COPPER CLAD STAINLESS STEEL
18 01
REVERE WARE

Dependability

. . . A PROVEN FACT WITH **H-P-M**

The dependability of H-P-M presses has been proven time and time again! Yes, building presses has been going on at H-P-M for three quarters of a century . . . and dependability is an unwritten part of the specifications you can count on us to continue.

H-P-Ms have contributed to many success stories. An excellent example is the line of H-P-M presses above . . . part of a 10 press operation at Rome Manufacturing Division of Revere Copper & Brass, Rome, New York. This installation is typical of the several H-P-M FASTRAVERSE press operations in other Revere plants. Because of the outstanding, on-the-job performance of H-P-M presses, Revere has installed over 20 H-P-Ms to keep pace with the increasing demand for the popular Revere Ware.

At H-P-M you will find a quality-minded organization, modern factory equipment and the most advanced production techniques. Proven *dependability* is inherent in every H-P-M press . . . it is the result of H-P-M's 75 years of specialized experience in the field of hydraulics. Whatever your production problem, you'll benefit by this experience. Invite us in at the planning stage, won't you?

HPM 75th YEAR
SERVING INDUSTRY THROUGH HYDRAULICS

THE HYDRAULIC PRESS MFG. COMPANY
1006 MARION ROAD
MOUNT GILEAD, OHIO, U.S.A.

Builders of Presses for the Metal Working & Processing Industries • Plastics Molding Presses • Die Casting Machines • Hydraulic Pumps, Valves & Power Units

"We can't keep up with them since they got those new THOR SCREWDRIVERS"

Thor PORTABLE POWER TOOLS

INDEPENDENT PNEUMATIC TOOL COMPANY
AURORA, ILLINOIS

Thor Portable Electric Screwdrivers and Nut Setters have speeded up production on thousands of assembly line jobs ever since Thor invented the *first* power screwdriver. For a demonstration of Thor *power . . . precise adjustment . . . handling ease* in your plant, call in Thor assembly tool experience — or write for free catalog.

Independent Pneumatic Tool Co., Aurora, Ill.

DRILLS • IMPACT WRENCHES • SCREWDRIVERS • TAPPERS
NUT SETTERS • GRINDERS • SANDERS • BENCH GRINDERS
POLISHERS • SAWS • HAMMERS • NIBBLERS
BALANCERS • BELT SANDERS • VALVE SHOPS • ACCESSORIES

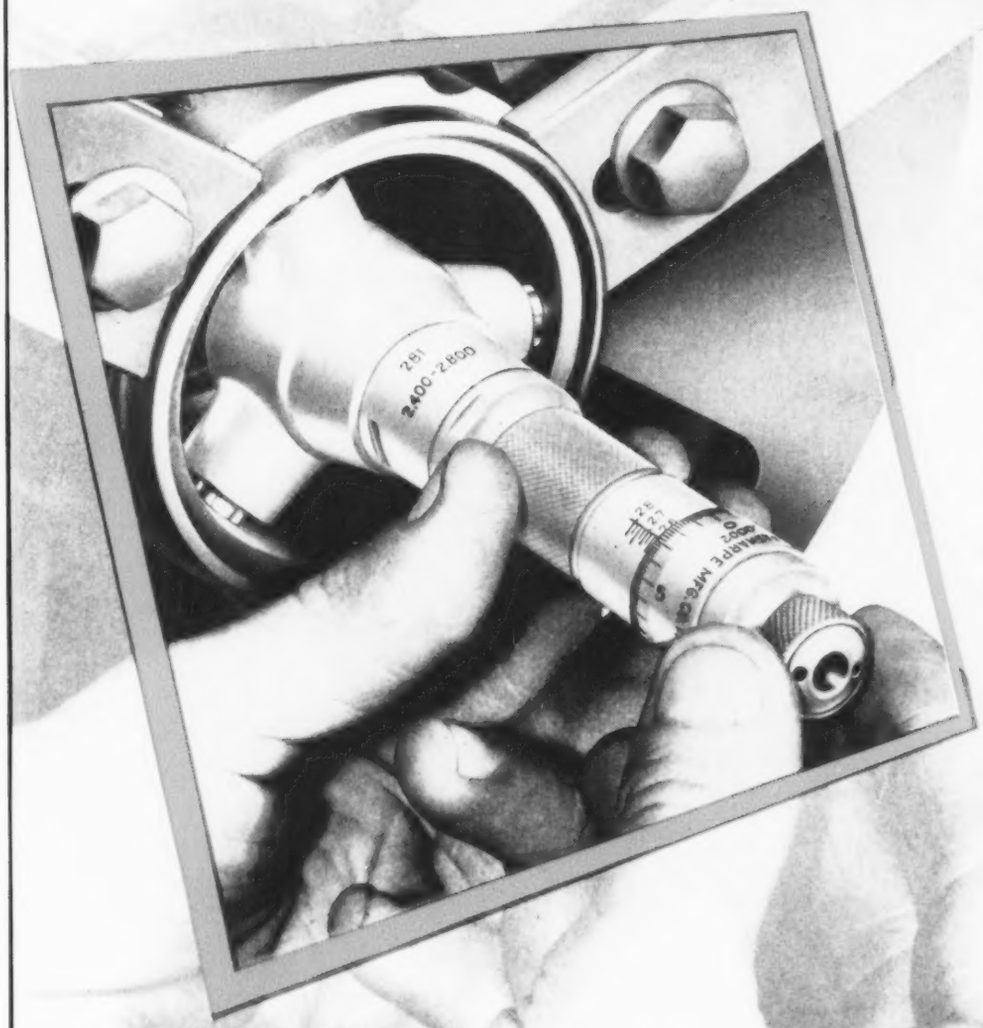
BUY IT from your DISTRIBUTOR

FACTORY SERVICE BRANCHES IN 20 PRINCIPAL CITIES

B·S **Productioneered**

For Low-Cost Direct Measuring of Bores and Holes

New INTRIMIK
Internal Tri-Point Micrometer



Now you can realize new economies and speed by measuring bores and holes with the Brown & Sharpe Intrimik. It's a precision micrometer . . . not a comparator. Takes measurements directly. Intrimik eliminates the need for many expensive plugs and setting rings . . . it is "Productioneered" to cut costs and speedup machining of work requiring inside measurements. Every feature for convenience, precision, and long service life has been incorporated in its design and construction.

- As easy to read as a conventional micrometer . . . measures bore or hole size accurately, disclosing exact amount of metal to be removed.
- Ratchet stop provides correct and unvarying measuring pressure.
- Self-aligning, axially and radially . . . three active measuring points automatically centralize tool in bore.
- Extremely rigid . . . no interchanging of parts (except for extensions).

SEE NEXT PAGE FOR RANGE OF SIZES

Brown & Sharpe

B·S Productioneered

to measure ANY size bore or hole within range of tool . . .

New INTRIMIK

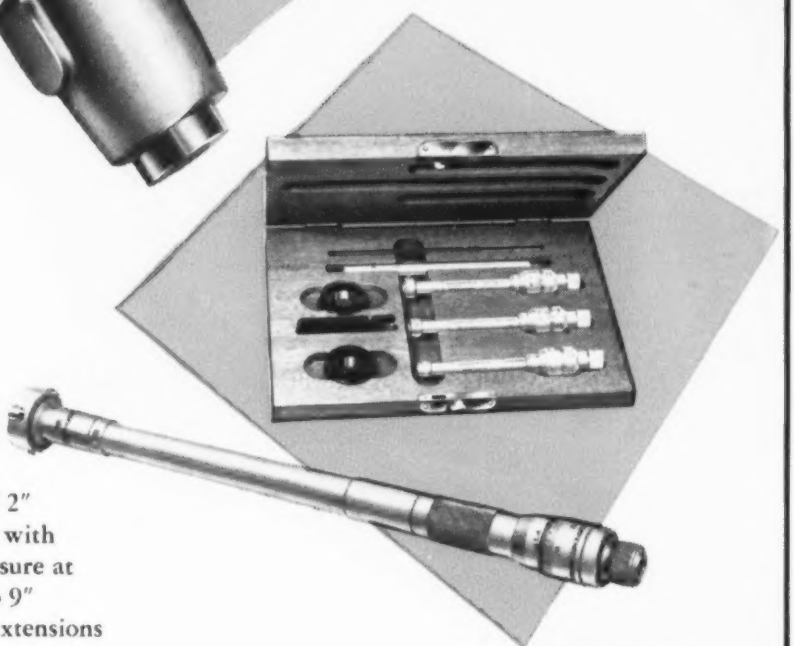
Internal Tri-Point Micrometer

The Brown & Sharpe Intrimik gives you a handy means of measuring inside diameters in increments of .0001″ on bore sizes from .275″ to .500″; and in increments of .0002″ on bore sizes from .500″ to 4.000″. Where measurements must be taken over a range of sizes, Intrimik offers tremendous savings over plug and comparator type gages.

WIDE RANGE OF SIZES

Intrimik is furnished in 16 individual sizes, and also in four sets to cover all measurements from .275″ to 4.000″. Measurements at depths of 2″ can be made with the three smaller sizes, and 3″ with the larger sizes. Extensions are available to measure at depths up to 6″ with the smaller sizes, and up to 9″ with the larger. For even greater depths, two extensions may be used.

Write for the illustrated Bulletin describing the new Intrimik.



Intrimik with single extension for measuring deep holes.

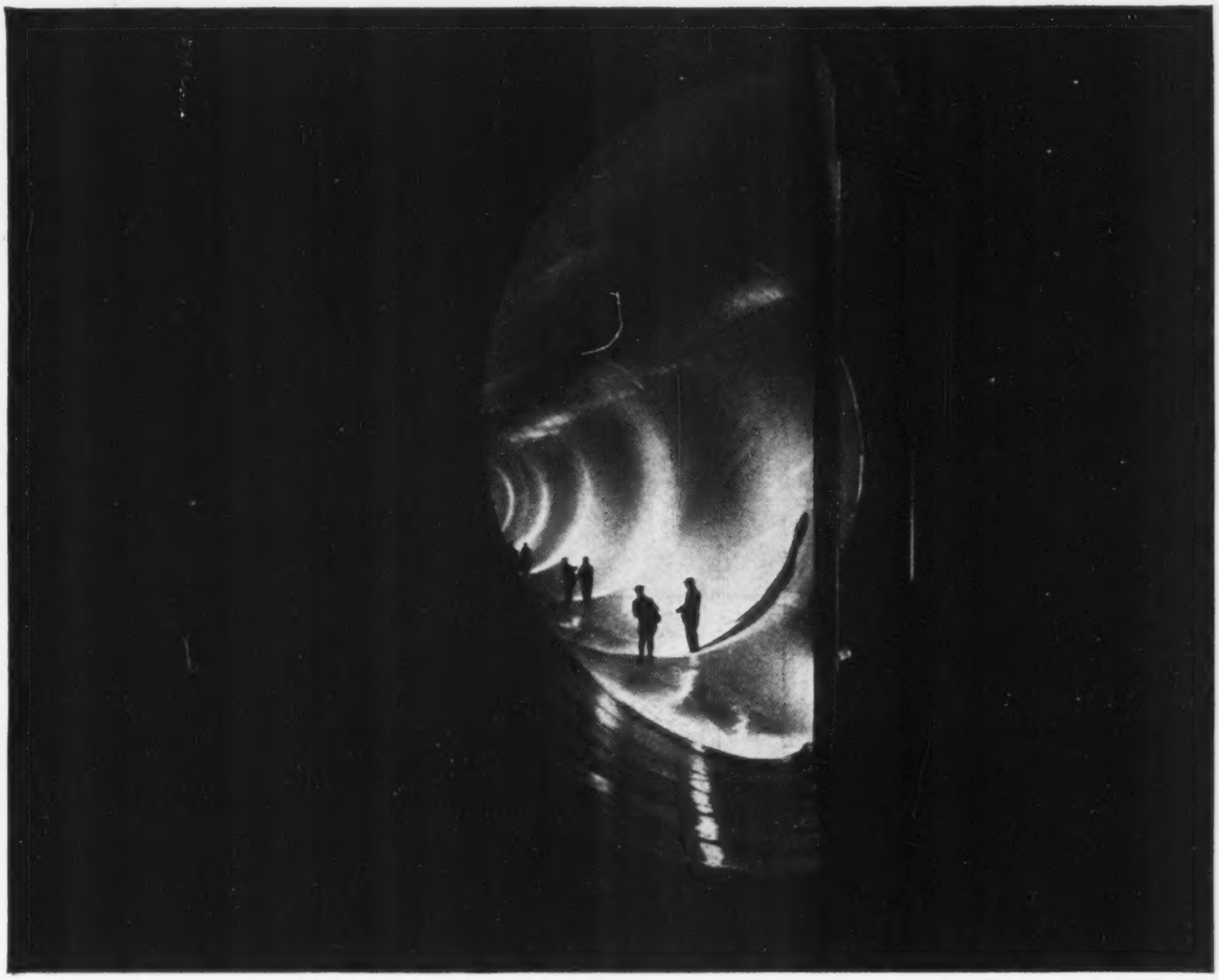
WE URGE BUYING THROUGH THE DISTRIBUTOR

Brown & Sharpe B·S

BROWN & SHARPE MFG. CO., PROVIDENCE 1, R. I., U. S. A.

PRINTED IN U. S. A.

Milling Machines • Grinding Machines
Screw Machines • Machine Tool Accessories
Cutters • Machinists' Tools
Electronic Measuring Equipment
Johansson Gage Blocks
Permanent Magnet Chucks • Pumps



From deep inside a mountain—

GOOD NEWS FOR ALUMINUM USERS

The availability of aluminum will be increased materially by new production facilities already well into construction at Kitimat, in the mountain wilds of British Columbia. There Aluminum Company of Canada, Ltd. ("Alcan"), whose products we distribute, is building a new plant, which in its initial phase will provide 200 million pounds more aluminum per year.

Abundant low-cost power is needed to produce aluminum economically. To serve Kitimat, a great hydroelectric plant will be installed inside a mountain. Water will travel through ten-mile tunnels, such as the one shown above, and drop half a mile to the power house, located inside a cavern.

Meanwhile, from existing facilities, millions of pounds of Alcan aluminum are helping to keep over a million metal-workers busy in American foundries and fabricating plants, turning out thousands of lightweight, long-lasting aluminum products for defense, industry, farm, and home.

ALUMINUM IMPORT CORPORATION

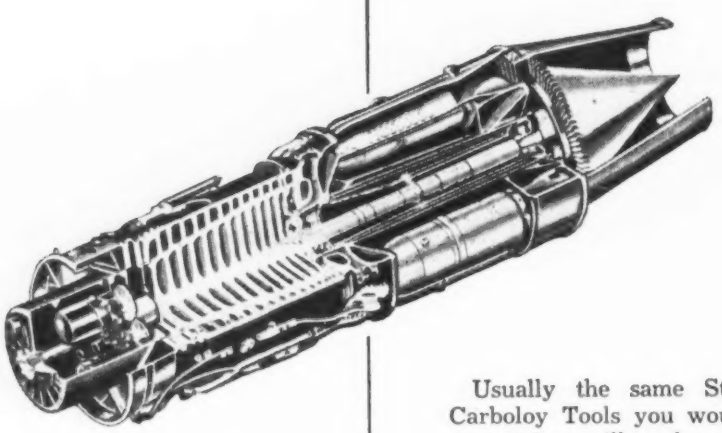
Distributing company of the **ALUMINIUM LIMITED** *group, in the Western Hemisphere*

Offices and agents in 40 cities — *Cable address:* ***ALIMPORT***

630 Fifth Avenue, New York 20 • 20 North Wacker Drive, Chicago 6 • 505 Terminal Tower, Cleveland 13

Av. Ing. Luis A. Huergo 1279, Buenos Aires • Rua Da Quitanda 96, Sao Paulo

Why inventory hundreds when these 11 Standard up to 80% of your single-point



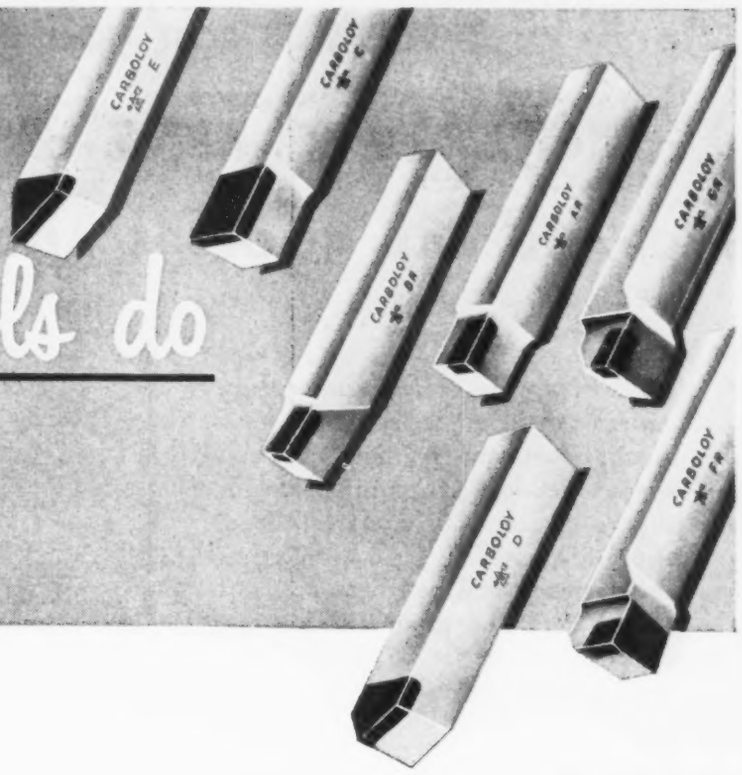
THE Broad Versatility of Standard Carboloy Tools and Blanks Includes Machining High-temperature Alloys

Today, titanium and most other so-called high-temperature alloys, such as those used in jet-engine manufacture, can be machined more successfully with cemented tungsten carbide than with any other cutting material . . . a great majority with straight tungsten carbide grades, such as found in Standard Carboloy Tools. Carboloy Tool engineers have intensively studied the machining of tough-alloy materials, and are able to present for your use the following:

Usually the same Standard Carboloy Tools you would use on cast iron will work very well. For heavy, rough cuts select a tough "Standard" grade. For lighter cuts, use harder, more wear-resistant grades. High-temperature alloys tend to work-harden, Standard Carboloy Tools are ideal because they hold a good cutting edge. Tools should be designed to be as free-cutting as possible; top side rake should be greater than normal, and a very small nose radius used. Cutting speeds vary widely between 75 f.p.m. and 600 f.p.m. Best feeds are .010″ to .020″ per revolution.

For specific, detailed advice on your particular problem, write to us, giving full details. Our engineers will promptly give you their recommendations.

# of tools Carboloy tools do machining?



Standard Carboloy Tools give you top production at top speeds . . . maximum return per tool dollar

Not only do Carboloy Standards drastically cut your inventory, but actual production and cost figures compiled on an industry-wide basis in all types of shops prove beyond all question that Carboloy Tools

. . . multiply production many times over

. . . diminish tool and maintenance costs

. . . outproduce, outlast steel tools up to 10 to 1.

Your continuing quest for greater production at lower cost is aided by such specialized Carboloy services as these: the Customer Training School, which shows your supervisory personnel how to get the maximum results with carbides; our wide range of training material – free manuals, technical charts, slide films showing techniques, and many others; and actual on-the-job instruction and assistance by our skilled tool engineers.

Remember, too – your needs on "rush" jobs are often answered by economical Carboloy Blanks, which may be quickly and easily brazed to tool shanks without waiting for specials.

For further information, mail the coupon, or call an Authorized Distributor or a Carboloy Field Engineer. Is there a better time than NOW?

"Carboloy" is the registered trademark for the products of Carboloy Department of General Electric Company

Plants at Detroit, Michigan; Edmore, Michigan; and Schenectady, New York

AUTHORIZED CARBOLOY® CEMENTED CARBIDES DISTRIBUTORS

CARBOLOY

DEPARTMENT OF GENERAL ELECTRIC COMPANY
11153 E. 8 Mile Road, Detroit 32, Michigan

Date_____

Please send me, without cost or obligation, Carboloy General Tool Catalog, GT-250.

NAME ..... POSITION .....

COMPANY .....

ADDRESS .....

CITY ..... ZONE ..... STATE .....

Our Authorized Distributor is .....

only at **DRAVO** can you get . . .

a **COMPLETE LINE** of

CRANE CAB COOLERS AND CONDITIONERS

No matter what radical temperature variations or atmospheric conditions occur in your industry, there's a Dravo Crane Cab Cooler or Conditioner available to protect your crane cab operator, safeguard his health, increase his efficiency and alertness and improve safety and production records in your operations.

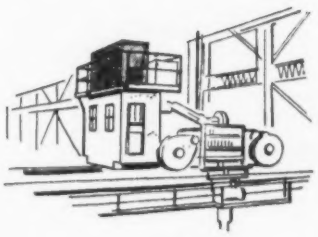
Dravo Crane Cab Coolers and Conditioners provide complete air conditioning, filter the air, remove dusts, dirt and fumes; heat the cab in winter, cool it in summer and provide constant ventilation the year around.

One Source of Supply— Easy Installation

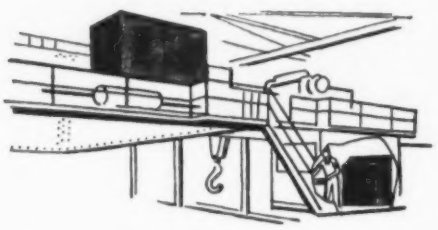
Dravo is your *one source of supply* for all crane cab coolers and conditioners. Units are quickly and easily installed with a minimum of downtime required. Parts are interchangeable on all units.

Available for Immediate Delivery

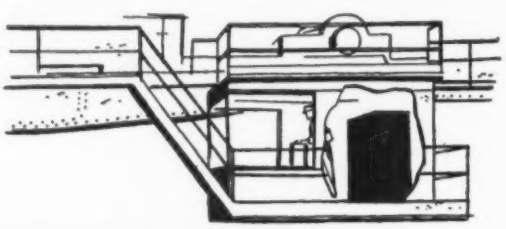
No delays in getting the units you want. For more information write for a complete catalog—or phone your nearest Dravo sales office and have our representative call on you.



SELF-CONTAINED COOLERS—mounted alongside the cab or on the cab roof. Only electrical leads and connections required. Thermostat control—fully automatic—maintains 85° F. temperature with ambient temperatures up to 175° F. Ideal for "hot spots" in steel and other metal-working industries.



SPLIT-TYPE COOLERS—installed on the crane in two sections—the heavy condenser unit *on the crane* wherever you want it—the light cooling section *in the cab* with the operator. Two sections joined only with refrigerant pipe and electrical connections.



SMALL HEATERS AND VENTILATORS—especially designed to filter dusts and dirt, remove fumes, provide constant ventilation, supply heat in winter. Ideal for cranes in quarrying, slag, cement and similar industries.

DRAVO

DRAVO

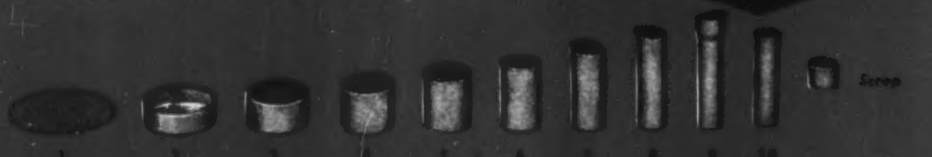
CORPORATION

605 Dravo Building, Fifth and Liberty Avenues, Pittsburgh 22, Pa.

ATLANTA • BOSTON • CHICAGO • CLEVELAND • DETROIT • NEW YORK • PHILADELPHIA • PITTSBURGH

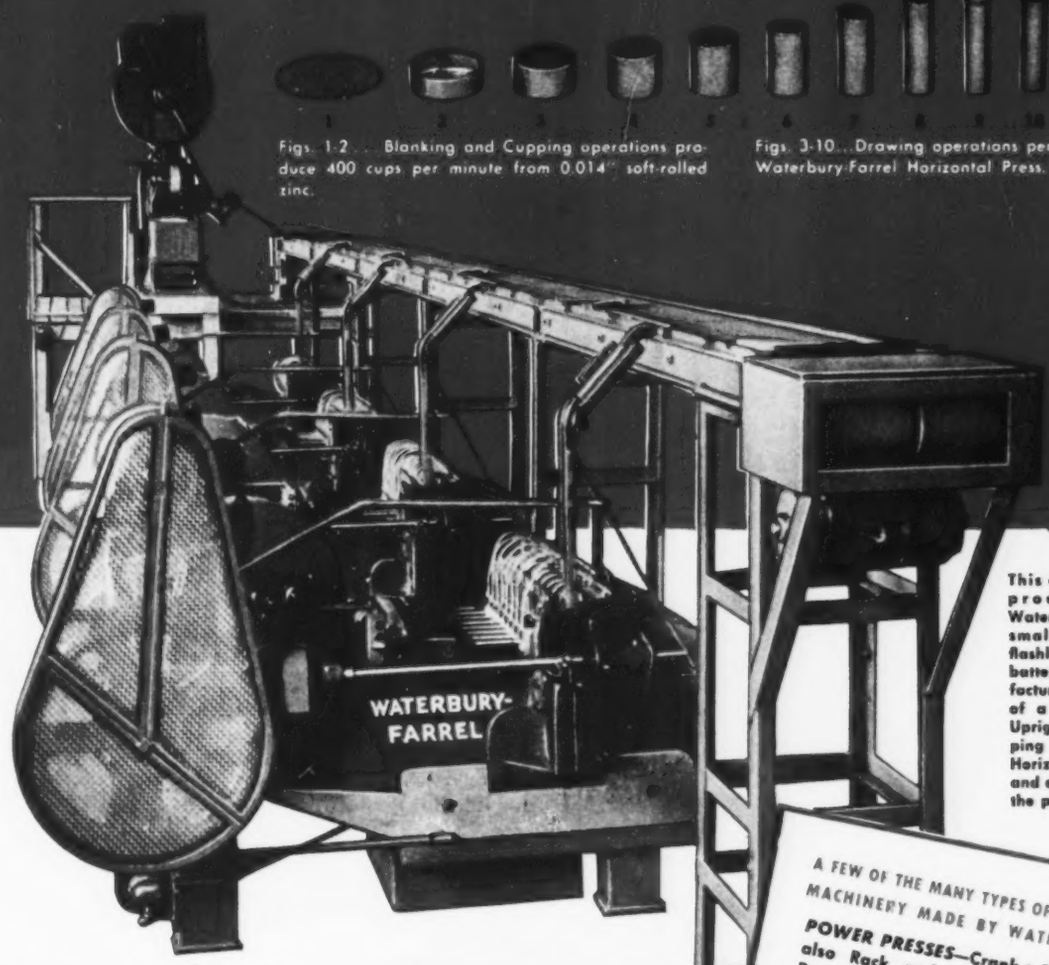
THIS WATERBURY-FARREL PRESS PRODUCTION TEAM

draws 340 shells per minute



Figs. 1-2 . . . Blanking and Cupping operations produce 400 cups per minute from 0.014" soft-rolled zinc.

Figs. 3-10 . . . Drawing operations performed by each Waterbury-Farrel Horizontal Press.



This complete, automatic production unit by Waterbury-Farrel produces small zinc containers for flashlight and hearing aid batteries for a large manufacturer. The unit consists of a 40-ton Double-acting Upright Blanking and Cupping Press, four 7-station Horizontal Drawing Presses and a conveyor which feeds the presses.

Here's an example of the automatic mass production you can get with Waterbury-Farrel horizontal drawing presses.

These modern deep-drawing machines are available singly or in complete production line setups. The presses are available in a wide range of sizes for handling a large variety of work. The number of stations range from 5 to 12; maximum strokes from 3" to 26"; production speeds up to 100 per minute.

Features Include:

- High production — continuous deep drawing with no intermediate annealing.
- Patented shell transfer mechanism.
- Patented die-holder lubrication.
- Horizontally held shells cannot be deformed by trapped liquid.

For further details, write, wire or phone your nearest Waterbury-Farrel office.

A FEW OF THE MANY TYPES OF METAL WORKING MACHINERY MADE BY WATERBURY-FARREL

POWER PRESSES—Crank • Cam and Toggle; also Rack and Pinion Presses • Transfer Presses • Multiple Plunger Presses • Hydraulic Presses, etc. **WIRE MILL EQUIPMENT**—Continuous Fine Wire Drawing Machines, including upright Cone and Tandem types Bull Blocks • String-up Machines • Spoolers, etc. • **COLD PROCESS BOLT AND NUT MACHINERY**—Headers (all types) • Re-headers • Trimmers • Thread Rolling Machines Slotters • Nut Tappers, etc. • **MILL MACHINERY**—Rolling Mills • Wire Flattening Mills, Chain Draw Benches • also Slitters • Straighteners • Pointers • Swagers • Cut-off Saws Coilers • Winders, etc.

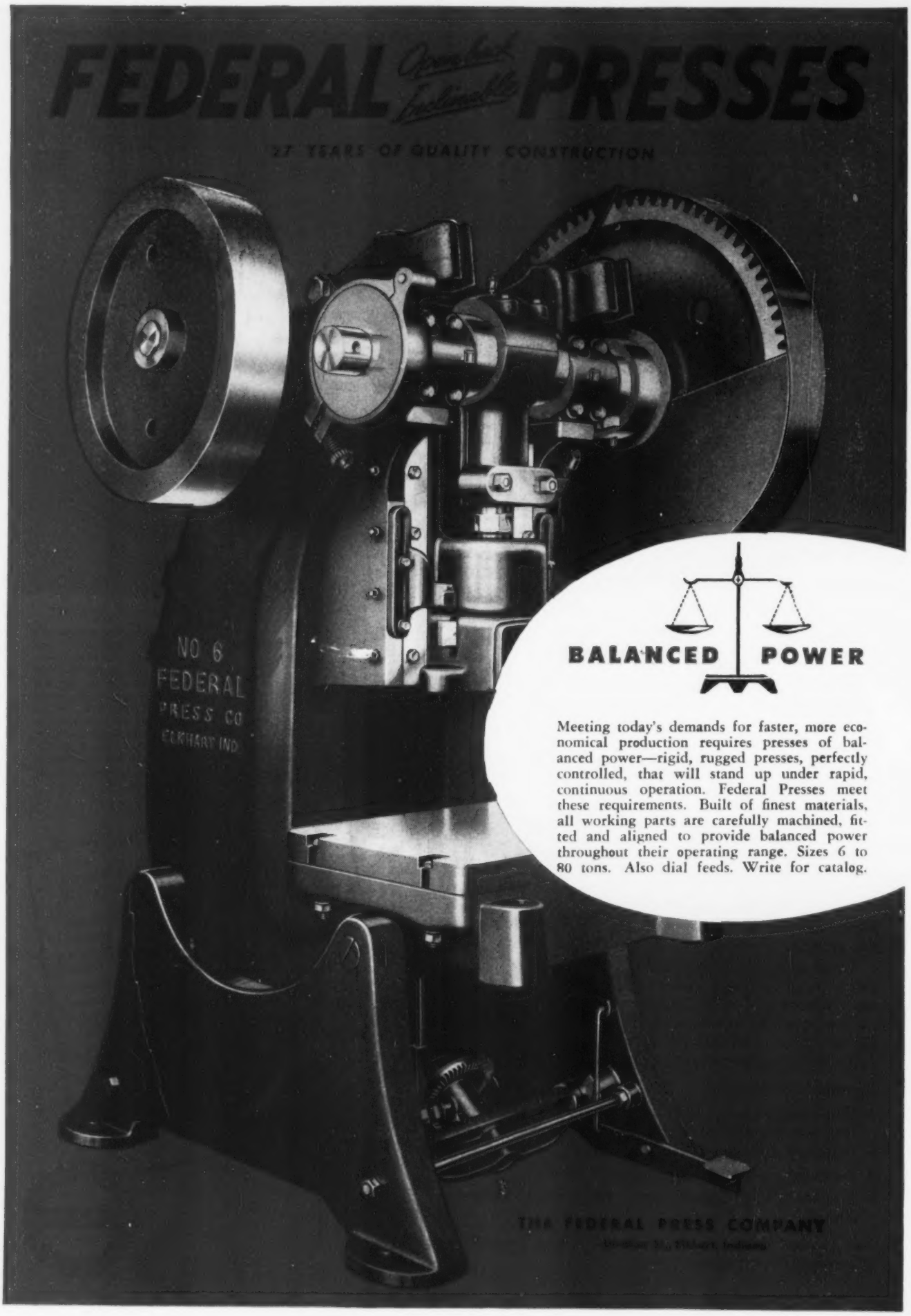
FOUNDED WATERBURY FARREL 1851

WATERBURY FARREL FOUNDRY & MACHINE COMPANY

In Equipment, Experience Counts.

FEDERAL Quality Leadership PRESSES

27 YEARS OF QUALITY CONSTRUCTION



BALANCED POWER

Meeting today's demands for faster, more economical production requires presses of balanced power—rigid, rugged presses, perfectly controlled, that will stand up under rapid, continuous operation. Federal Presses meet these requirements. Built of finest materials, all working parts are carefully machined, fitted and aligned to provide balanced power throughout their operating range. Sizes 6 to 80 tons. Also dial feeds. Write for catalog.

WATSON-STILLMAN

HYDRAULIC POWER *becomes* *Fire Power*

QUICKLY...
EFFICIENTLY... ECONOMICALLY

with W-S ORDNANCE PRESSES

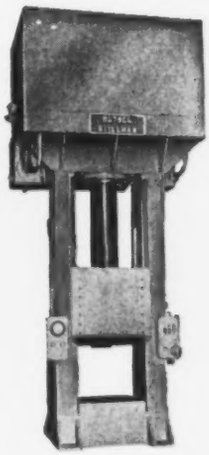
W-S Hydraulic Press flexibility of control is a natural for the precision required in shell forging manufacture. Combine this control with the economy of using only the press tonnage and stroke required and the exactly suitable speed and you have the answer to every pressing operation.

Reject percentage drops instantly, noise levels decrease, maintenance problems become insignificant when hydraulics take over your Ordnance press jobs. And hydraulics, of course, have been synonymous with Watson-Stillman for more than a century.

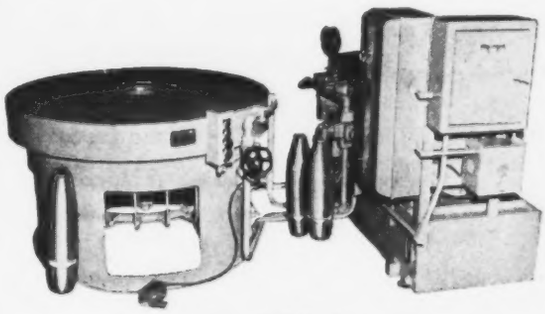
Write now specifying your type and size of shell for today's W-S Press recommendations . . . it's backed by 104 years of hydraulic experience.

Cold Extrusion Press

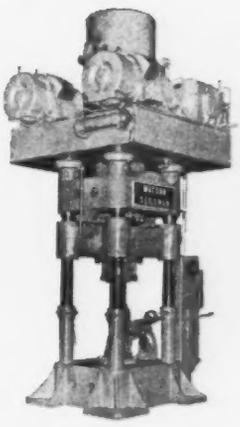
9-M-5



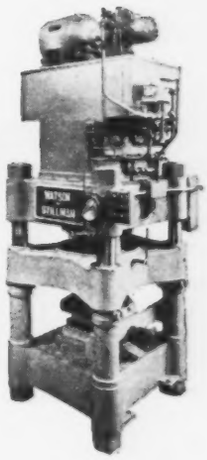
Shell Piercing Press



Shell Bander



Shell Nosing Press



Billet Breaker

Branch Office:
228 N. La Salle, Chicago, Ill.

W-S HYDRAULIC

Manufactured in Canada by
Canadian-Vickers, Ltd., Montreal

Factory and Main Office:
HYDRAULIC MACHINERY DIVISION
ROSELLE, NEW JERSEY

WATSON-STILLMAN
ESTABLISHED 1848

W-S "Completeline" Hydraulics — The Shortest Distance From Production to Profits

COMPANHIA VALE DO RIO DOCE S. A.

ITABIRA IRON ORE FOR OPEN HEARTH FURNACES

VALUE

ANALYSIS PERCENTAGES GUARANTEED BY CONTRACT

Fe (Guaranteed minimum)	68.5
P (Guaranteed maximum)	.045
Moisture (Guaranteed maximum)	1.0

Recent shipments have averaged about .80% Moisture, 69.01% Fe, .028% P, and .27% SiO_2. Sizes are half inch to eight inches.

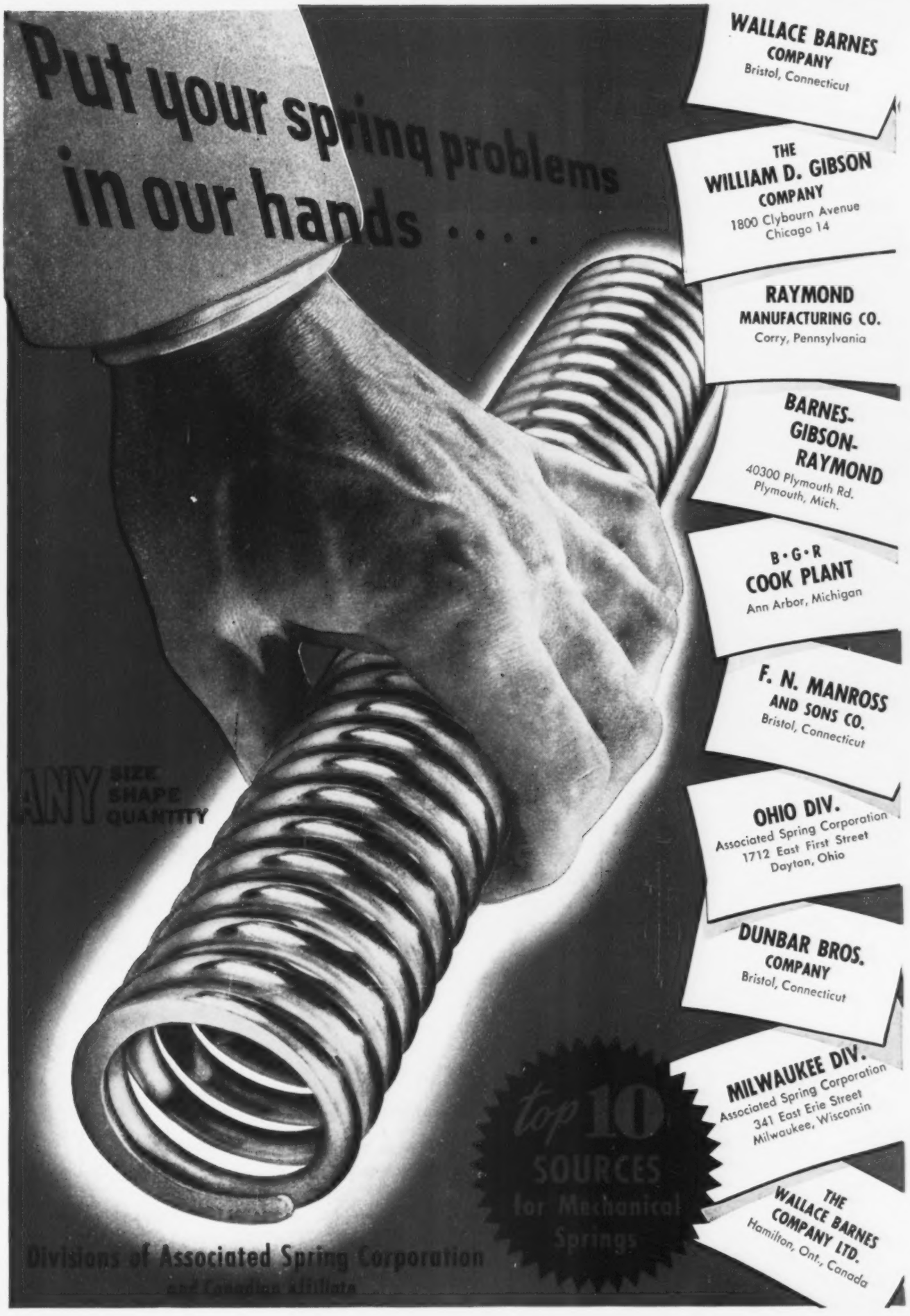
Steel companies now using ITABIRA IRON ORE as charge and feed ore report substantial savings in operating costs. These result principally from hard structure, low moistures, high iron content and absence of impurities. Important reductions in the use of STEEL SCRAP have been achieved in open hearth operations by using higher percentages of ITABIRA ORE in the charge.

Its use in all phases of Steel production is constantly increasing. The excellent yields being realized are attributed to the unique properties of ITABIRA ORE.

Inquiries should be addressed to the Vale do Rio Doce Trading Company, 63 Wall St., New York 5, New York.

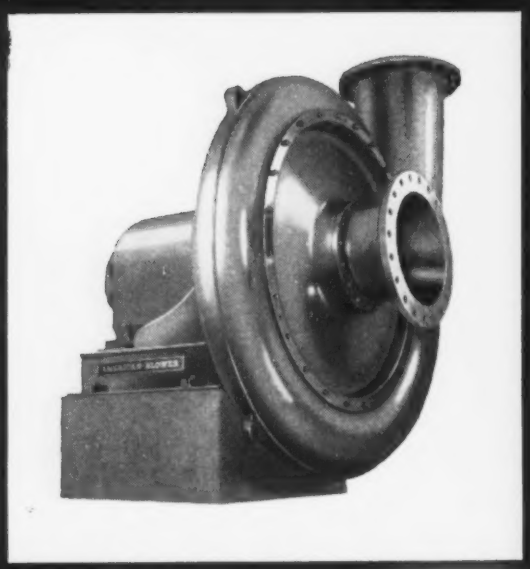
COMPANHIA VALE DO RIO DOCE S. A.

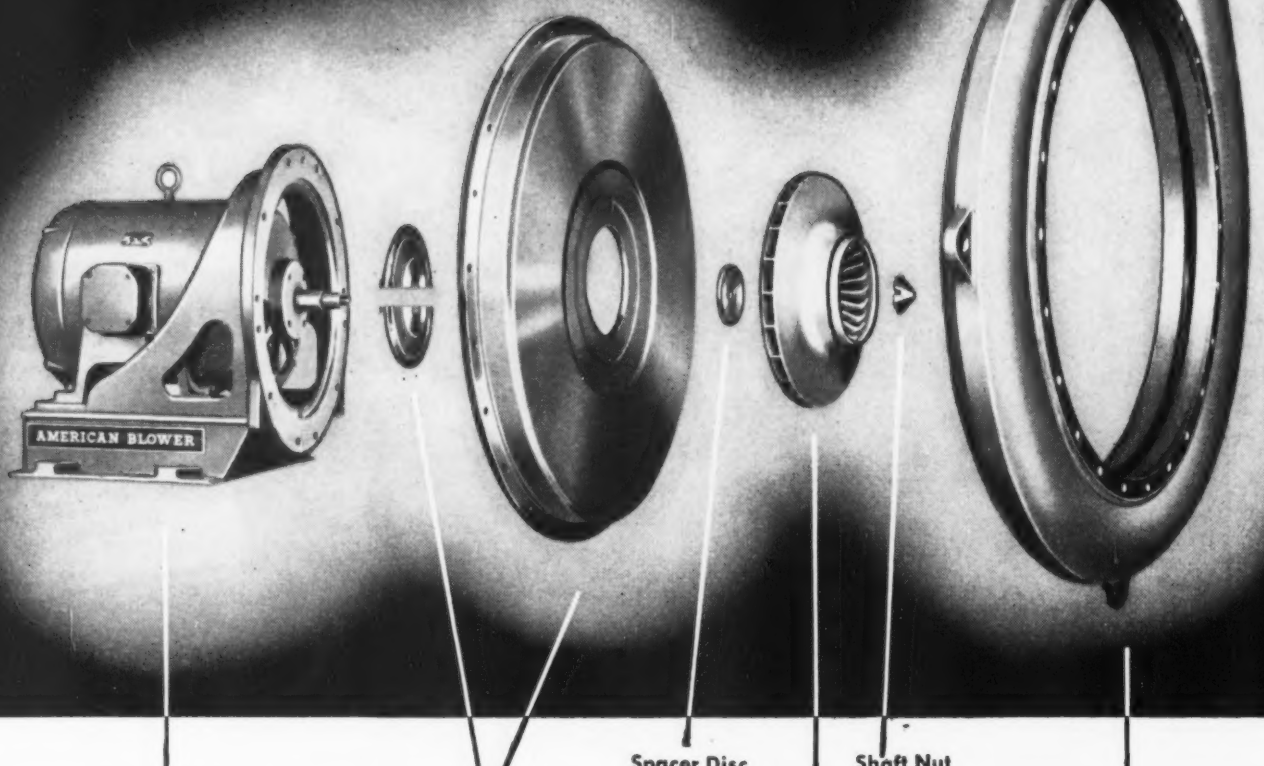
RIO de JANEIRO BRAZIL


Put your spring problems in our hands . . . .
ANY SIZE SHAPE QUANTITY
WALLACE BARNES COMPANY
Bristol, Connecticut
THE WILLIAM D. GIBSON COMPANY
1800 Clybourn Avenue
Chicago 14
RAYMOND MANUFACTURING CO.
Corry, Pennsylvania
BARNES-GIBSON-RAYMOND
40300 Plymouth Rd.
Plymouth, Mich.
B·G·R COOK PLANT
Ann Arbor, Michigan
F. N. MANROSS AND SONS CO.
Bristol, Connecticut
OHIO DIV.
Associated Spring Corporation
1712 East First Street
Dayton, Ohio
DUNBAR BROS. COMPANY
Bristol, Connecticut
MILWAUKEE DIV.
Associated Spring Corporation
341 East Erie Street
Milwaukee, Wisconsin
THE WALLACE BARNES COMPANY LTD.
Hamilton, Ont., Canada
top 10 SOURCES for Mechanical Springs
Divisions of Associated Spring Corporation
and Canadian Affiliate

AMERICAN BLOWER

centrifugal





Motor — Standard NEMA construction. Short motor shaft extension and conservative impeller loads assure operation below first critical speed of rotor assembly. **Baseplate** — heavy welded steel for rigidity and accurate alignment.

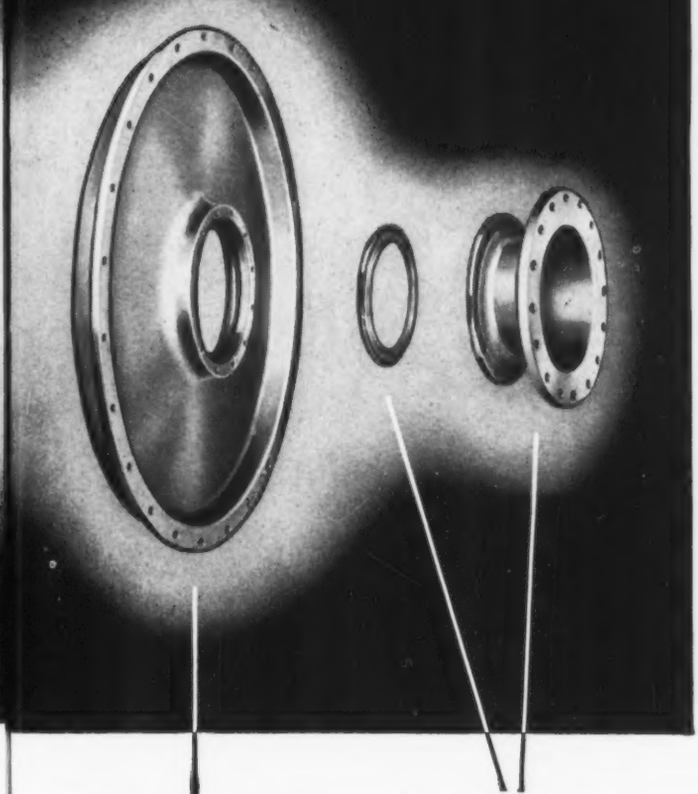
Shaft Packing — Nonferrous, cast construction. No mechanical contact between stationary and rotating parts. **Backplate** — cast iron, bolts with dowel fit to baseplate.

Impeller—Shrouded, single-piece, heat-treated, cast-aluminum alloy construction. Statically and dynamically balanced. Overspeeded to 20% above maximum operating speed before assembly.

Volute Casing — Cast-iron construction. Bolts with dowel fit to backplate. Twenty-four casing positions available in either direction of rotation.

Serving home and industry: AMERICAN-STANDARD • AMERICAN BLOWER

compressors



Suction Cover—Cast-iron suction cover forms outer wall of diffuser passage and bolts with dowel fit to volute casing.

Annulus Packing—Permits accurate alignment with impeller during assembly. **Inlet Nozzle**—Provides uniform gas distribution. Flanged for standard pipe connections.

Designed for
EFFICIENCY
Built for
DEPENDABILITY

American Blower Single Stage Centrifugal Compressors offer several outstanding design features.

For example, the improved scroll design and deep diffuser passage efficiently convert velocity energy into pressure. Labyrinth annulus packing minimizes recirculation of gas around impeller inlet. Aerodynamic design of impeller blade inlets results in high efficiencies and dependable performance.

Before shipment, each compressor is thoroughly tested in accordance with A.S.M.E. Power Test Code for Centrifugal Compressors and Exhausters.

American Blower single stage units are available in sizes from 30 to 600 HP with pressures from 1¼ to 3¾ lbs. For technical data consult the nearest American Blower Branch Office or write us for Bulletin 109.

AMERICAN BLOWER CORPORATION, DETROIT 32, MICHIGAN
CANADIAN SIROCCO COMPANY, LTD., WINDSOR, ONTARIO

Division of American Radiator & Standard Sanitary corporation

AMERICAN BLOWER

CHURCH SEATS • DETROIT LUBRICATOR • KEWANEE BOILERS • ROSS HEATER • TONAWANDA IRON

Possible applications for FIBERFRAX fiber

THERMAL INSULATION

- Used loose, bonded, packed, or as a blanket for insulating furnaces, jet engines, etc.
- Tape for wrapping pipes and other parts requiring high temperature insulation.
- Fireproofing for safes and containers.
- Packing for expansion joints, kiln cars, etc.
- As a paper, fire curtain, or bonded into a fire wall.

REINFORCING AGENT

- To reinforce electrical insulators, battery plates, etc.
- As a base for sprayed-on ceramic coatings.
- With resins to produce fiber-plastic materials.
- With deposited metals to make porous structures.
- In brake linings.

AS A FILTER

- To filter gases (can be burned clean and reused).
- Filtration of liquids (oils, acids, etc.).
- Flame filter to remove ash (as in gas turbine).

MISCELLANEOUS

- As a wick or other capillary body.
- Cushioning or vibration dampening material.
- Bonded into acoustical tiles.
- As a diffusing material (high corrosion resistance).
- As a catalyst support.
- For dielectric materials.

This listing does not represent all possible uses. These are simply suggested applications, many of which are untried.

versatile ceramic fiber — insulates, makes superfine filter, resists 2300°F (and more)!

This cotton-like material is a ceramic fiber, a new synthetic with a host of interesting possibilities. Brand new, this remarkable fiber (trademarked FIBERFRAX) easily withstands 2300 F without loss of properties, and up to 3000 F without melting — temperatures far higher than possible with existing mineral or glass fibers. Applications already tested range from — use as a superfine filter (even fine enough to filter bacteria) — to insulating blankets for combustion and exhaust systems of jet engines — to dielectric papers (with electrical losses ¼ those of Kraft paper).

FIBERFRAX fiber is made by melting aluminum oxide and silica (both non-critical materials) at 3300 F. The molten mix is then poured and blasted with an air jet. Instantly, a mass of fluffy white fibers is formed. These fibers are as long as 3″, yet average only 4 microns in diameter (about 1/25 the diameter of a human hair). Weight, as blown, is just 2 lbs per cu ft.

This random mass of fibers has many talents. Experimentally, it has been bonded into batts, made into felted rolls or blankets, and even made in paperlike forms (such as tape). When packed to density of about 6 lbs per cu ft, it can make a better heat insulator for many furnaces than high grade insulating brick. Because of its pronounced capillary qualities, it seems suitable for use as a wick. FIBERFRAX fiber is also virtually impervious to most acids. It could be used as a catalyst carrier. And it seems a natural substitute for asbestos — or it could be combined with this rather critical material.

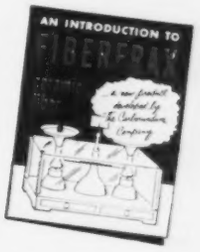
Inherently an excellent electrical insulator, FIBERFRAX fiber will find many dielectric applications. It also lends itself to use as a reinforcing agent — for example, in battery plates, or in low pressure laminates, or perhaps as a base for sprayed on ceramics. It is resilient and makes a good cushioning or packing material, particularly for high temperature spots. It could be used for fire proofing, or bonded into a firewall. FIBERFRAX tiles also deaden sounds. In bulk or paper form it makes an unparalleled filter for gases, liquids, flames, etc.

Do any of these applications suggest possibilities to you? If so, please write or phone us. Though FIBERFRAX fiber is presently available only in bulk form, all the forms mentioned here (and perhaps others) will soon be commercially available. Why not check up now?

CARBORUNDUM

Trade Mark

"Carborundum" and "Fiberfrax" are trademarks which indicate manufacture by The Carborundum Company



FIBERFRAX material magnified 500 times. Note the diverse size and random arrangement of fibers (ideal properties for a filter material).

FOR COMPLETE INFORMATION — USE THIS COUPON

Dept. Y-112, Refractories Division
The Carborundum Co., Perth Amboy, N. J.

Please send free folder on FIBERFRAX fiber.

Name_____

Position_____ Company_____

Street_____

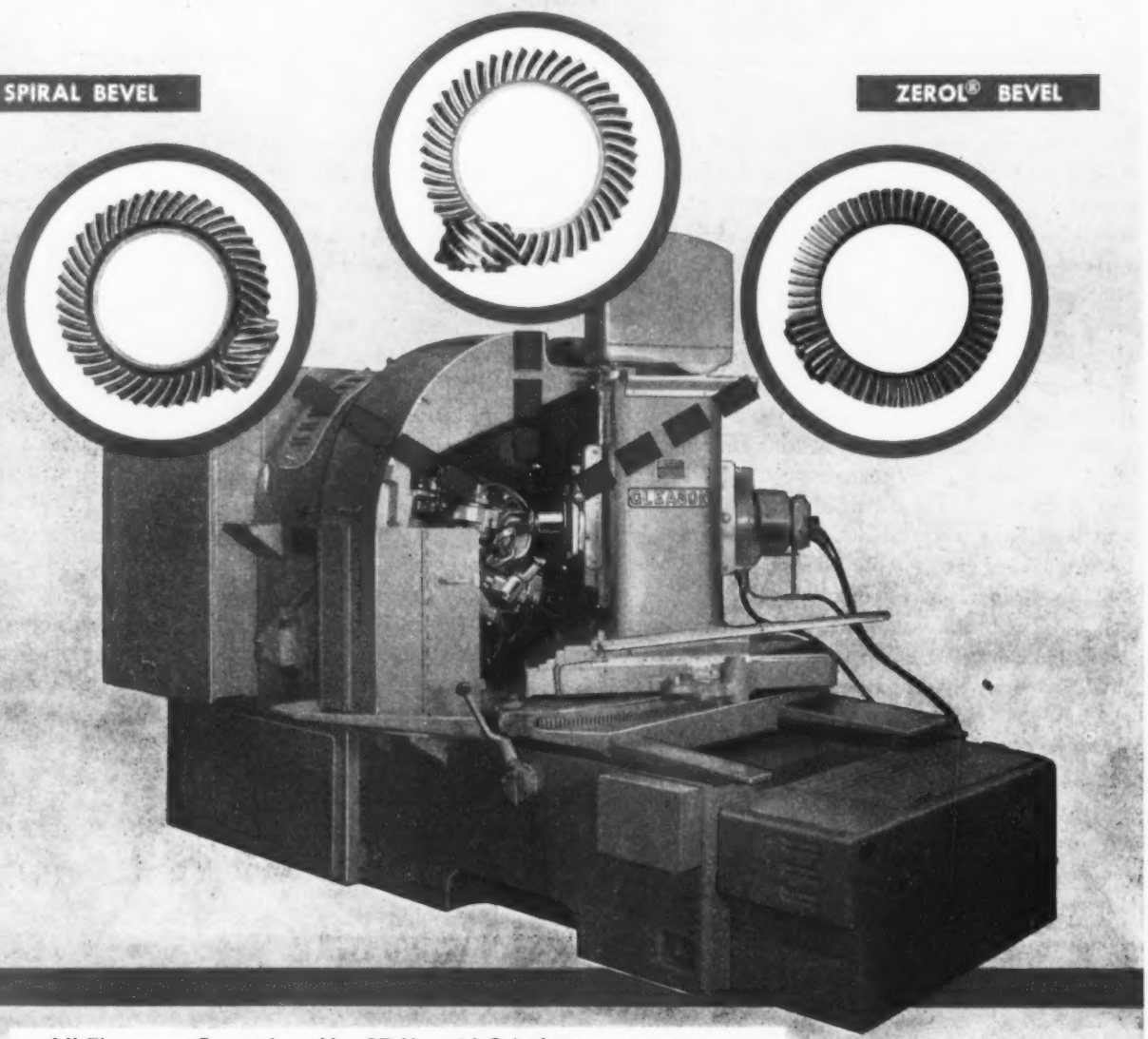
City_____ Zone____ State_____

3 ON 1

HYPOID

SPIRAL BEVEL

ZEROL® BEVEL



- All Three are Ground on No. 27 Hypoid Grinder
- Produces Highest Precision and Does It Consistently
- Automatic Grinding Cycle Eliminates Human Element
- Features The Ultimate in Accuracy and Productivity
- Suitably Designed and Equipped for Job Lots or High Production

GLEASON

GLEASON WORKS

BUILDERS OF BEVEL GEAR MACHINERY FOR OVER 85 YEARS

1000 UNIVERSITY AVE. · ROCHESTER 3, NEW YORK

THE IMPROVED

Exide-Ironclad

BATTERY

OUTSTANDING NEW FEATURES INCLUDING

the polyethylene insulating tube sealer combine to make Exide-Ironclad, *more than ever before*, YOUR BEST POWER BUY . . . AT ANY PRICE.

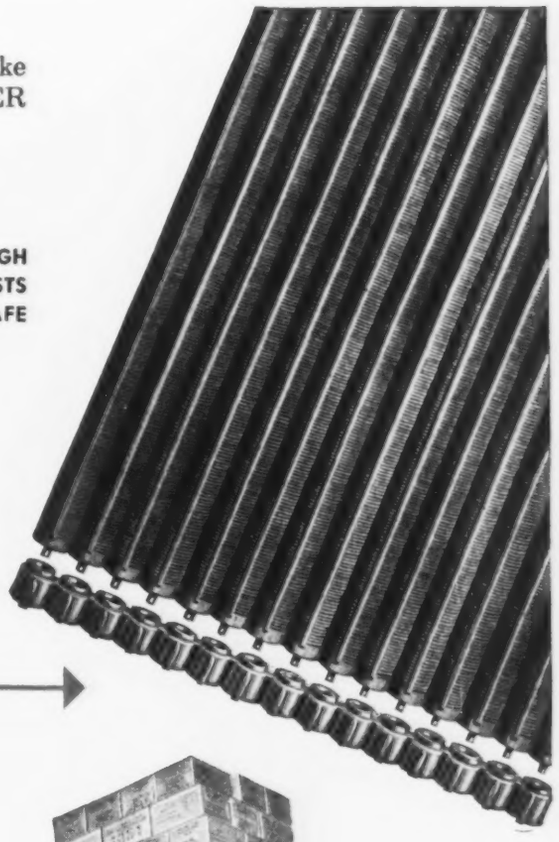
THE IMPROVED EXIDE-IRONCLAD IS BUILT TO GIVE YOU . . .

RAPID ACCURATE HANDLING . . . UNIFORM RATE OF HANDLING . . . HIGH AVAILABILITY . . . LOW OPERATING COSTS . . . LOW MAINTENANCE COSTS . . . LOW DEPRECIATION COSTS . . . HIGH MANEUVERABILITY . . . SAFE HANDLING.

BECAUSE OF . . .

IMPROVED POSITIVE PLATE CONSTRUCTION. The long-life grids now contain SILVIUM—an alloy of silver, lead and other components—which make them highly corrosion resistant.

. . . the New Polyethylene insulating tube sealer of acid-proof, non-corroding plastic. It fits snugly into slotted tubes of positive plate, and reduces loss of active material. Even the small sediment deposit of the past is reduced 50%. Thus more active material remains available, and the high battery capacity is maintained for a longer working life.



IMPROVED NEGATIVE PLATES for higher electrical efficiency.

NEW SEALING COMPOUND—provides permanent seal between jar and cover.

SEAMLESS SHOCK-PROOF JAR, of high quality rubber combines tensile strength and elongation for long-life and heavy-duty service.

NEW UNBREAKABLE PLASTIC VENT PLUGS of polyethylene.

TYPES, SIZES AND CAPACITIES for all kinds and makes of battery-electric trucks—hand and rider.

THE ELECTRIC STORAGE BATTERY CO.
Philadelphia 2
Exide Batteries of Canada, Limited, Toronto

1888
DEPENDABLE BATTERIES FOR 64 YEARS
1952

"EXIDE-IRONCLAD" and "SILVIUM" *Reg. T.M. U.S. Pat. Off.*

WHAT *Life-Lines* REALLY DELIVER IS MORE SERVICE...LESS SERVICING

What *Life-Lines* really deliver is

...more service
...less servicing

"We can't afford equipment breakdowns. We manufacture ice cream making machinery and operate franchise stores throughout the country. Store operators know very little about maintenance. We *must* select equipment that assures trouble-free performance with minimum maintenance. That's what Life-Lines give us. That's why we standardize on them."

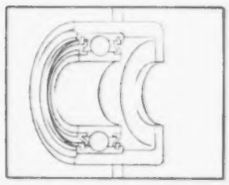
The above statement by the chief engineer of an eastern manufacturing plant tells the Life-Line story best. Summed up it means more service, less servicing with Life-Lines.

Take the Life-Linestarter®, for example. Contacts last longer because exclusive "De-ion®" arc extinction snuffs out arcs fast... reduces contact pitting. Simple seesaw balance of clapper prevents accidental opening; kickout spring prevents accidental closing. Compare with any other starter and see why Life-Linestarters offer *more service with less servicing.*

The Life-Line motor's advance design completely eliminates periodic lubrication. Pre-lubricated factory-sealed ball bearings need no greasing attention. Throw your grease guns away! Further, steel construction cuts breakage from rough usage. Superior insulation and winding techniques lengthen electrical life. On-the-job reports of a half million Life-Lines show why you get more service with less servicing.

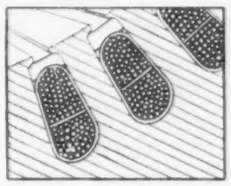
It costs no more to get Life-Line performance. Ask your Westinghouse representative for details or write Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Penna.

J-21684

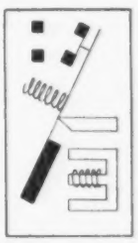


MOTOR

Needs no lubrication. Pre-lubricated factory-sealed bearings eliminate troubles due to under or overlubrication, dust and dirt.

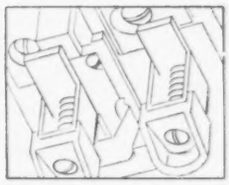


Cuts winding burnouts. Pear-shaped slot design eliminates pockets. No corner voids remain to collect dirt, moisture.



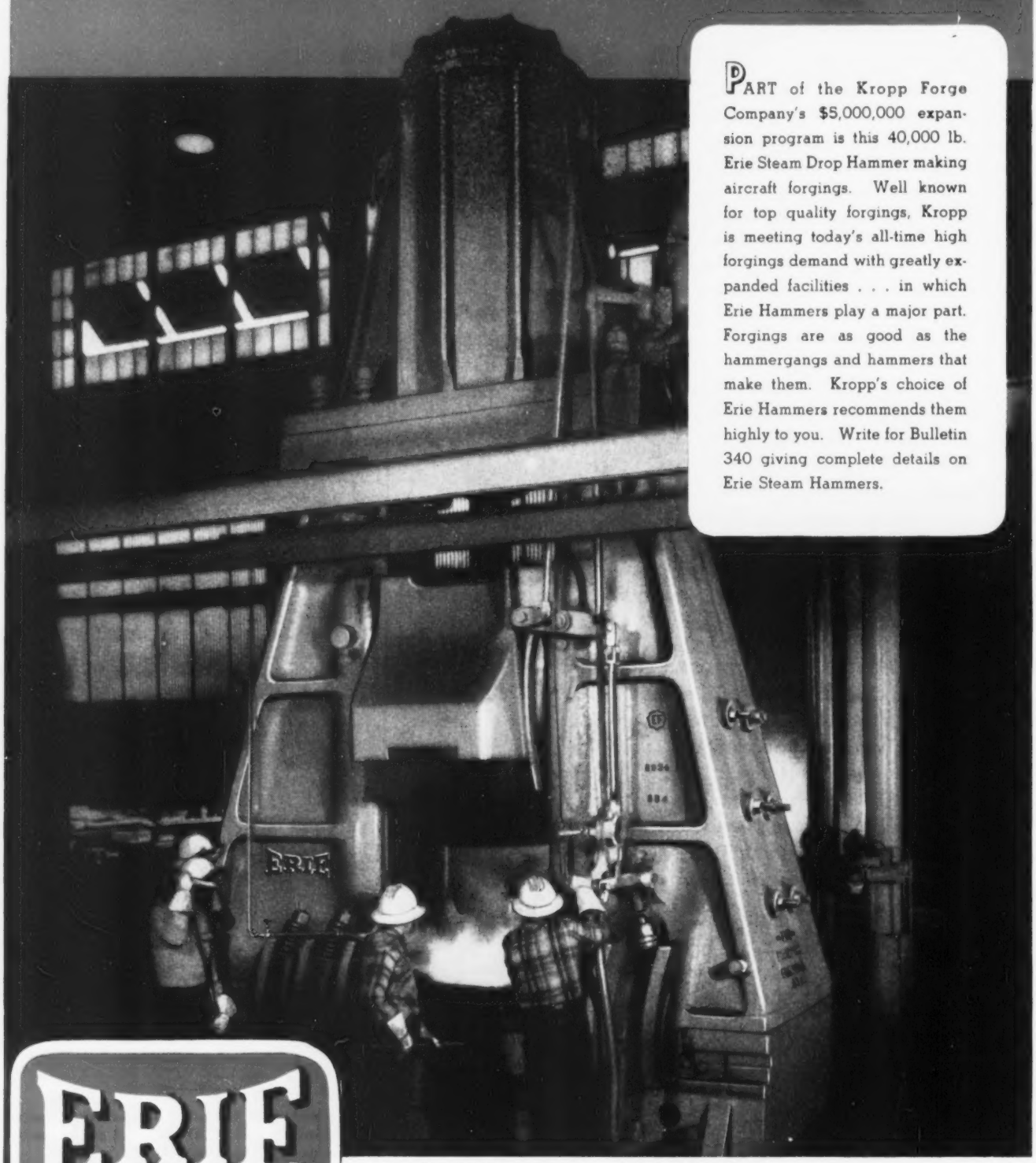
STARTER

Never Jams. No sliding surfaces to wear—no sticking—no jamming—nothing to wear or replace.



Never needs filing. Silver-to-silver contacts eliminate filing. Discolored silver maintains high conductivity.

40,000 lb. ERIE STEAM HAMMER
Increases Production at Kropp Forge Company



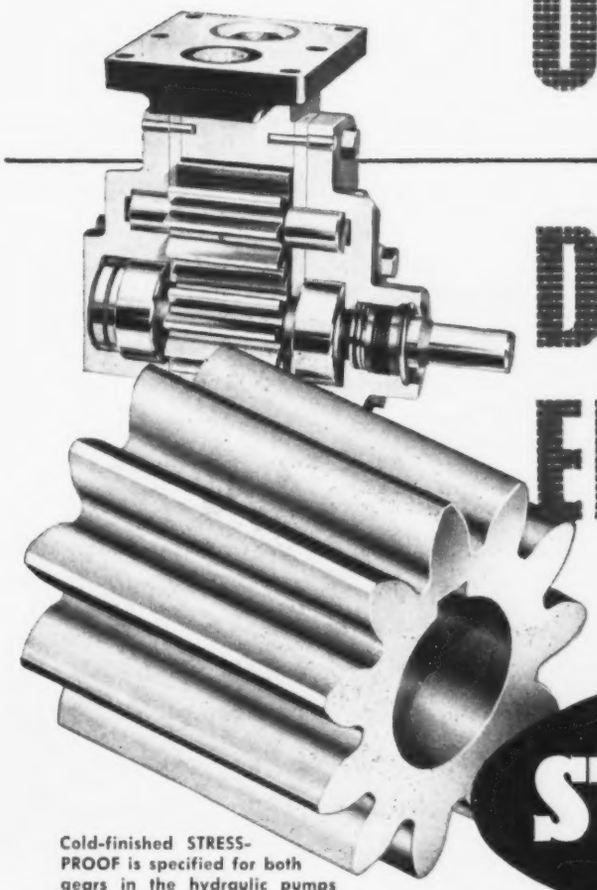
PART of the Kropp Forge Company's $5,000,000 expansion program is this 40,000 lb. Erie Steam Drop Hammer making aircraft forgings. Well known for top quality forgings, Kropp is meeting today's all-time high forgings demand with greatly expanded facilities . . . in which Erie Hammers play a major part. Forgings are as good as the hammergangs and hammers that make them. Kropp's choice of Erie Hammers recommends them highly to you. Write for Bulletin 340 giving complete details on Erie Steam Hammers.

ERIE

ERIE FOUNDRY COMPANY ERIE, PENNSYLVANIA

Dependable FORGING HAMMERS • HYDRAULIC PRESSES

CARBURIZING UNNECESSARY



Cold-finished STRESS-PROOF is specified for both gears in the hydraulic pumps made by Anthony Co., Streator, Ill.

DISTORTION ELIMINATED

ON THIS ANTHONY PUMP GEAR WITH . . .

STRESSPROOF®

SEVERELY COLD-WORKED, FURNACE-TREATED, COLD-FINISHED STEEL BARS

STRESSPROOF has been specified for years for this Anthony hydraulic gear. Gears made of STRESSPROOF have the high accuracy required for quiet, efficient operation. Also, they will run for the life of the equipment without appreciable wear or pitting.

Carburized gears, the alternate for STRESSPROOF, distort in hardening. Costly finishing operations are then required or noisy, inefficient gears result. STRESSPROOF, on the other hand, is used as machined . . . gives accurate, highly finished gears with long, trouble-free life.

STRESSPROOF's value to manufacturers like Anthony Company stems from its unique combination of four important qualities in the bar—(1) *high strength;* (2) *machinability;* (3) *wearability;* and (4) *minimum warpage.* STRESSPROOF costs less than other quality cold-finished bars. It is available in cold-drawn or ground and polished finish.

SEND FOR Free Engineering Bulletin "New Economies in the Use of Steel Bars."

La Salle Steel Co.
1412 150th Street
Hammond, Indiana

Please send me your STRESSPROOF Bulletin.

Name_____

Title_____

Company_____

Address_____

City_____ Zone __ State _____

La Salle **STEEL CO.**

. . . the Most Complete Line of Carbon and Alloy Cold-Finished and Ground and Polished Bars in America.

ACCURACY

STRENGTH

RIGIDITY

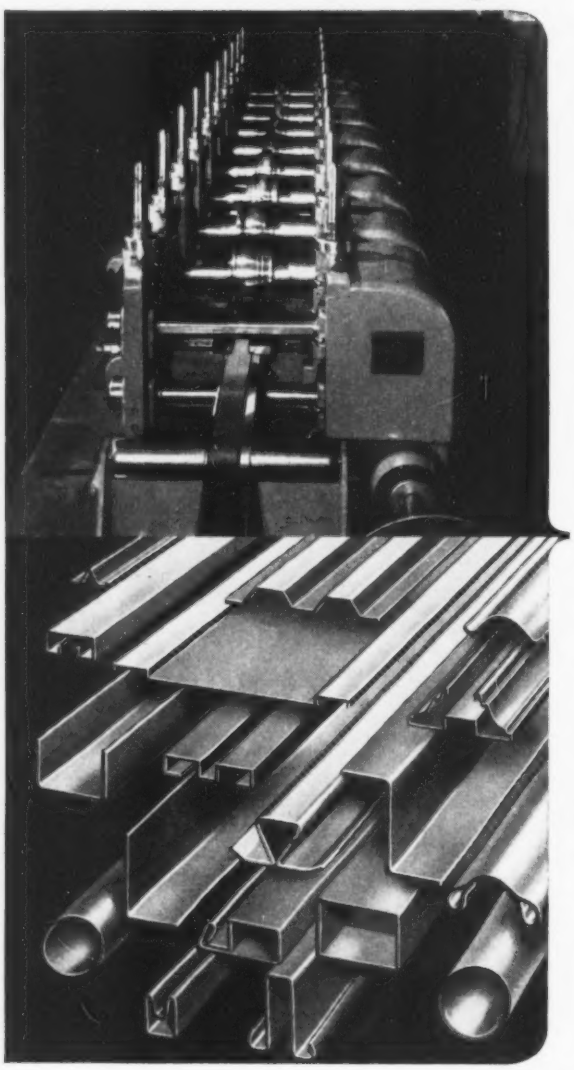
FINE FINISH

LIGHT WEIGHT

HIGH PRODUCTION

COLD-ROLL-FORMING

Gives you All, at Lower Cost—



● In busy metal working plants, vigilant production men are constanly on the lookout for places where, due to increased demand for their products, the time is ripe for a change of methods and equipment. They know, for instance, that in the shaping of metals into finished products or components, cold roll forming, when it can be employed, has many important quality and cost advantages over all other methods. When and how to make the change then becomes their problem.

In some instances, by a redesign of product, it becomes possible to profit by the advantages afforded by cold roll forming. In others, the mere need for higher production makes the change profitable. Again, redesign often leads to savings in weight which, in the case of the more expensive metals, alone may amount to more than the total conversion cost.

When such changes are indicated, feel free to avail yourself of the Yoder engineering service in analyzing and determining practicability of the change, choice and cost of equipment, and other pertinent questions.

THE YODER COMPANY
5510 Walworth Avenue • Cleveland 2, Ohio

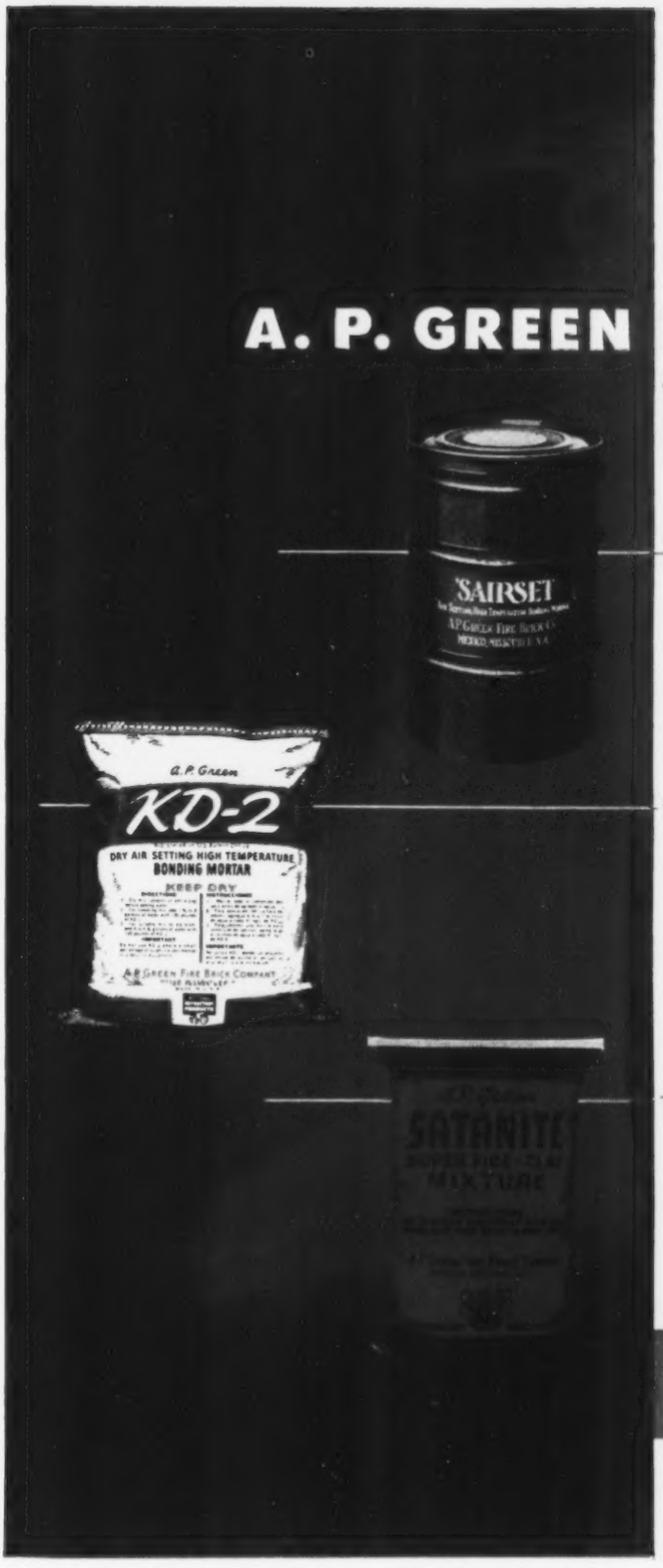
Complete Production Lines

- ★ COLD-ROLL-FORMING and auxiliary machinery
- ★ GANG SLITTING LINES for Coils and Sheets
- ★ PIPE and TUBE MILLS—cold forming and welding

ENGINEERING YODER MANUFACTURING

Get Longer Life and Better Service from Your Firebrick Linings with

A. P. GREEN High Quality BONDING MORTARS



'SAIRSET

For the past 28 years, 'SAIRSET has been recognized as the finest quality air-setting, high temperature bonding mortar on the market. It forms a thin, airtight joint and bonds all types of firebrick into a one-piece unit at all temperatures. The high refractoriness of 'SAIRSET guards against fusion or softening of the joints . . . increasing the service of the firebrick.

KD-2

An air-setting, high temperature bonding mortar that will not fuse or soften in the joints. KD-2 develops excellent plasticity and workability immediately on mixing—no long soaking period required. Gives maximum protection because it does not shrink . . . there are no cracks for flame and slag to attack. KD-2 is shipped dry and will not freeze, deteriorate or lose its working and bonding characteristics in storage.

SATANITE

A slag resisting, high alumina fire-clay mortar for laying firebrick. It has a P.C.E. value of Cone 36. SATANITE has been proved in use in all types of furnaces in which molten iron, steel or slag is in contact with the brick, and joint erosion is unusually severe. It provides longer runs and lower refractory costs.

A. P. Green REFRACTORY PRODUCTS

For specific recommendations without obligation on your refractory problems or requirements, contact your local A. P. Green distributor . . . he is listed in the yellow pages of your telephone directory . . . or write direct.

DISTRIBUTORS IN THE PRINCIPAL CITIES OF THE WORLD

A. P. GREEN FIRE BRICK COMPANY
Mexico, Missouri, U. S. A.

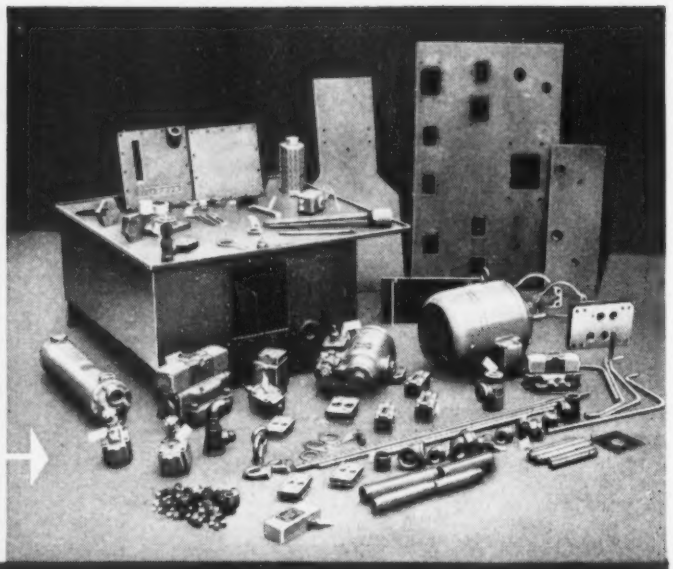
In Canada

A. P. GREEN FIRE BRICK COMPANY, LTD.
Toronto 15, Ontario

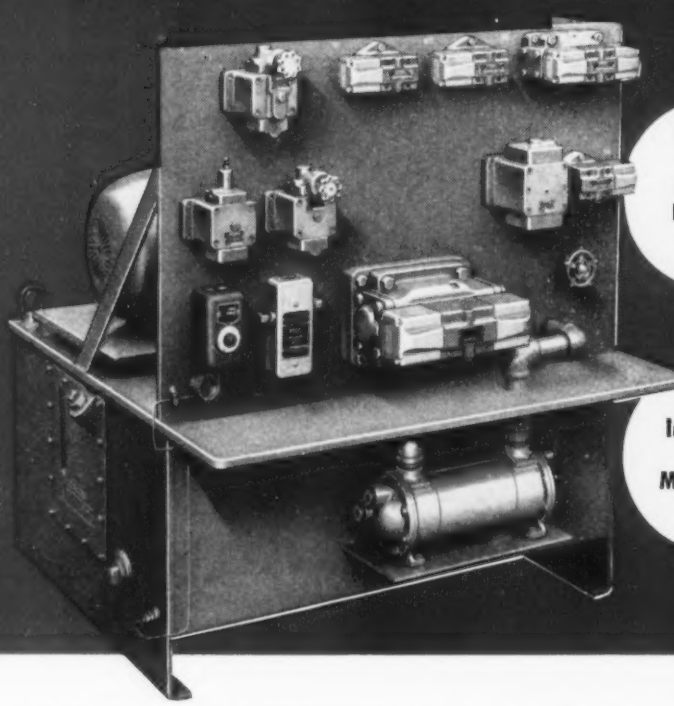
OTHER A. P. GREEN PRODUCTS
Proved in Service by the Steel Industry

CASTABLE REFRACTORIES • KAST-SET • KAST-O-LITE
FIREBRICK • KRUZITE • MIZZOU • KX-99 • MEX-KO
CLIPPER • EMPIRE • PLASTIC FIREBRICK • SUPER HYBOND
SUPER-PLASTIC • PLASTIC QUIK-PAK

It Takes MORE than a Collection of Parts



To Make A VICKERS CUSTOM BUILT POWER UNIT



Improve and Simplify Hydraulic Design

Reduce Installation and Maintenance Costs

A Vickers Custom Built Power Unit is much more than a collection of parts . . . just as the machines you build are more than the castings, shafting, gears, motors, etc. that go into them.

The Vickers Unit is designed and built with the "know-how" obtained during more than a quarter century of experience in practically every kind of hydraulic operation, plus a thorough understanding of your needs. It is built exactly to your individual requirements. All necessary pumps, valves, intermediate piping, oil reservoir, motors, controls, etc., are in one compact and self-contained "package". It includes all needed hydraulic accessories such as oil filters, air cleaners, oil level gauges, fittings, etc. Hydraulic connections may be grouped in a conveniently located manifold.

The result is simplification of hydraulic design and important savings in installation and maintenance costs. Vickers undivided responsibility for the entire hydraulic control system is another important advantage to both the machine builder and his customer. • Write for new Bulletin 52-45.

VICKERS Incorporated

DIVISION OF THE SPERRY CORPORATION

1420 OAKMAN BLVD. • DETROIT 32, MICH.

Application Engineering Offices:

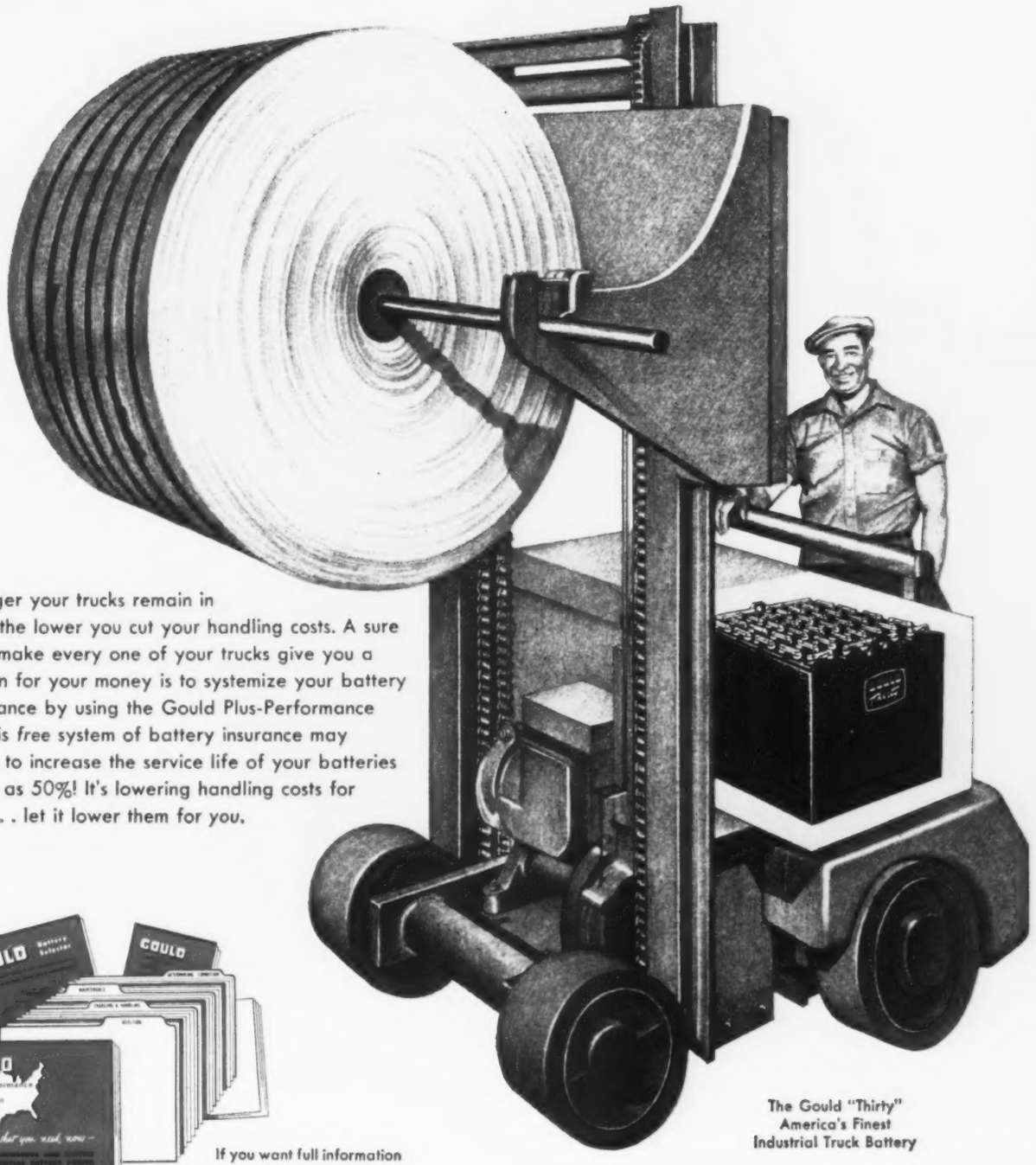
ATLANTA • CHICAGO (Metropolitan) • CINCINNATI • CLEVELAND
DETROIT • HOUSTON • LOS ANGELES (Metropolitan) • NEW YORK
(Metropolitan) • PHILADELPHIA (Metropolitan) • PITTSBURGH
ROCHESTER • ROCKFORD • SEATTLE • TULSA
WASHINGTON • WORCESTER

6053

ENGINEERS AND BUILDERS OF OIL HYDRAULIC EQUIPMENT SINCE 1921

SYSTEMIZE BATTERY CARE...

Get a Good Run for Your Money!



The longer your trucks remain in service, the lower you cut your handling costs. A sure way to make every one of your trucks give you a good run for your money is to systemize your battery maintenance by using the Gould Plus-Performance Plan. This *free* system of battery insurance may be able to increase the service life of your batteries as much as 50%! It's lowering handling costs for others . . . let it lower them for you.

If you want full information on how this plan can lower your handling costs, write Gould Battery Information Headquarters.

The Gould "Thirty" America's Finest Industrial Truck Battery

GOULD *Industrial Batteries*

GOULD-NATIONAL BATTERIES, INC., TRENTON 7, N. J.

Always Use Gould-National Automobile and Truck Batteries

The Iron Age . . . super

salesman to metalworking

Look how The IRON AGE towers over *all* other standard size metalworking publications . . . gives you greater value for your advertising dollar:

1. LARGEST TOTAL DISTRIBUTION — 35,700
2. GREATER PLANT COVERAGE — 18,500
3. DEEPER PENETRATION IN MAJOR PLANTS

LARGEST TOTAL DISTRIBUTION

Each week more than 35,700 copies of The IRON AGE are rushed to waiting readers. 22,700 of the total distribution is *paid circulation*, 50% more than any other metalworking weekly and constantly growing. No other metalworking publication can match The IRON AGE renewal rate — 84.58%.

As metalworking expands, The IRON AGE keeps pace to give your advertising the greatest impact possible.

No. 1 in Metalworking Circulation

Circulation Breakdown as of May 1, 1952
Including Advertisers' Copies

★Manufacturers of Assembled Metal Products, Equipment and Machinery	18,411
★Commercial Processing Plants and Parts Mfg's:	
(a) Forging, Stamping, Welding, Machining, Heat Treating and Finishing Plants	1,667
(b) Plate and Structural Fabricators	916
(c) Foundries and Die Casting Plants	1,413
(d) Other Parts, not End Products	1,809
★Producers of Metals	2,876
Railroads & Other Transportation Services, Public Service Corporations, Mines, Manufacturers of Nonmetal Products	1,292
Government	671
Distributors, Dealers and Exporters	2,766
Consulting and Contracting Engineers	521
Trade Associations, Chambers of Commerce, Libraries, Colleges and Vocational Schools	820
Miscellaneous	893
Awaiting Classification	689
Total	34,744
Agencies, Comps. and File Copies	956
GRAND TOTAL	35,700

★27,092 copies in the very heart of the industry—more than any other metalworking publication.

GREATER PLANT COVERAGE

Every week The IRON AGE enters more than 16,500 metalworking and metal producing plants . . . reaches more than 18,500 plants of all types. No other metalworking publication reaches so many.

At least one copy of The IRON AGE goes every week to every U. S. metalworking plant employing 50 or more plant workers. In highly mechanized plants, such as manufacturers of machinery, at least one copy goes to every plant employing 40 or more plant workers.

The plants reached by The IRON AGE represent more than 97% of the entire metalworking industry's purchasing power.

DEEPER PENETRATION IN MAJOR PLANTS

The number of copies of The IRON AGE reaching each plant is determined by its size and product. Mass production metalworking plants . . . those that employ 1000 or more plant workers . . . are specially analyzed to provide individual copies for executives who exert major buying influence. Added circulation also goes to such industries as automotive, aircraft, and machinery whose production trends promise heavier purchases.

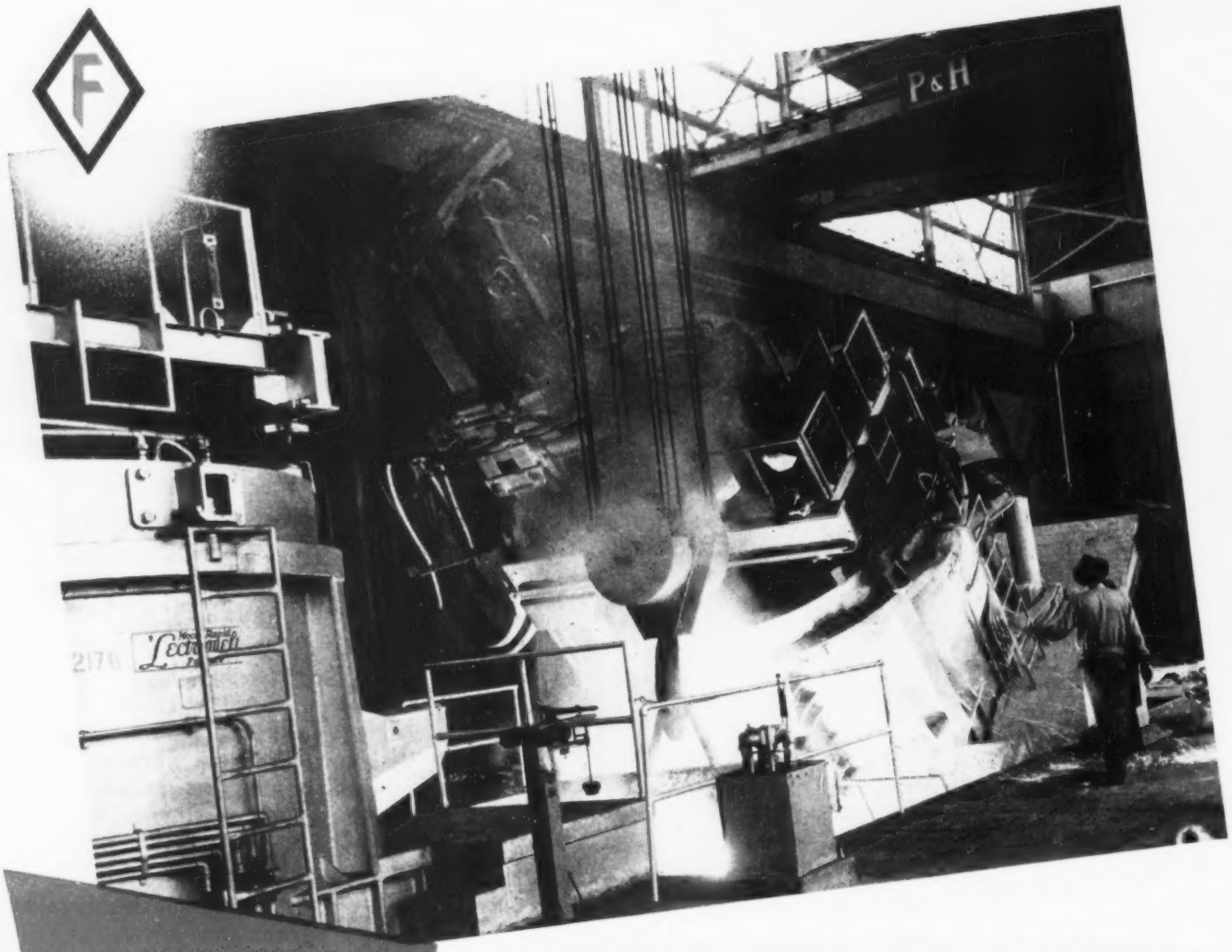
The wide coverage, the deeper penetration of The IRON AGE, both unmatched by any other metalworking publication, combine to give you unequalled value for your advertising dollar.

The most successful salesman in the industry

The Iron Age

No. 1 in metalworking

ABC CCA NBP A CHILTON PUBLICATION, 100 E. 42nd ST., N. Y. 17, N. Y.



ANNOUNCING! COMPLETE QUALITY CONTROL with FINKL'S *OWN* ELECTRIC FURNACE STEELS

These NEW twin electric furnaces for making high quality steels are the most modern installation in the country and are housed in a new building complete with up-to-the-minute metallurgical facilities.

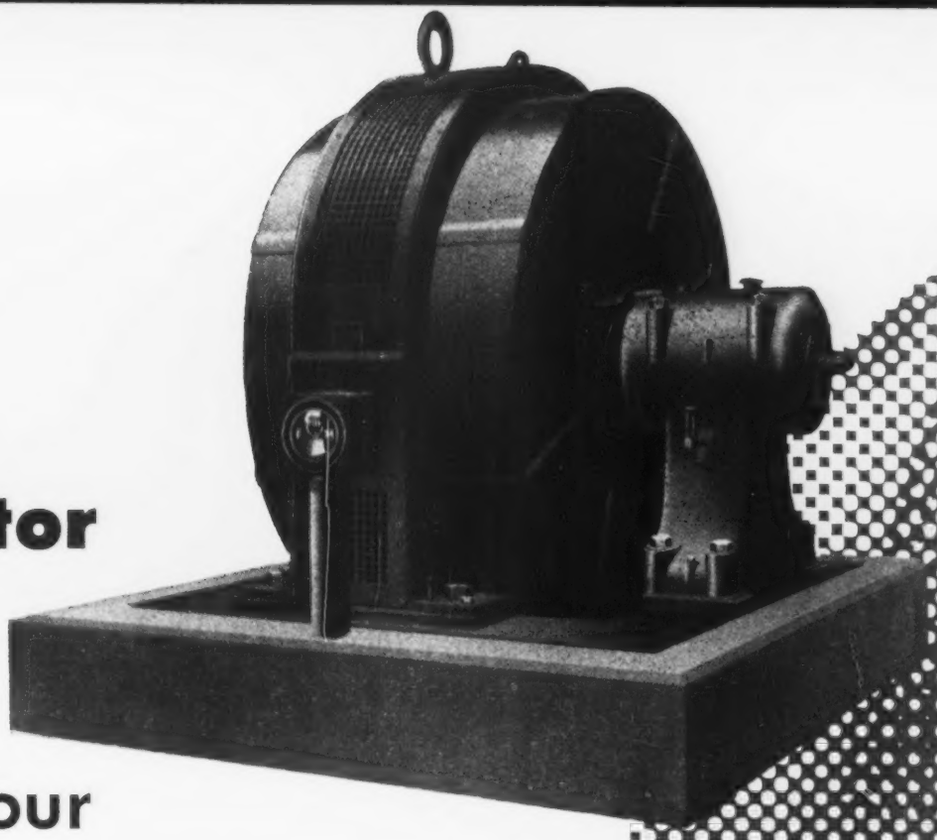
The advantage of making the steels for your forgings and die blocks is obvious — quality is our paramount concern. The analysis is assured with the speed and accuracy of a direct reading spectrometer. Temperatures of the molten bath are determined by immersion pyrometers. *Nothing is left to chance.*

Now with this great new advantage of controlling the quality of the steel added to the craftsmanship of Finkl personnel in forging, heat treating, machining and testing, we are proud and pleased that we can serve you with the highest quality die blocks and forgings available today.

A. Finkl & Sons Co.

2011 SOUTHPORT AVENUE • CHICAGO 14

FORGINGS • DIE BLOCKS • ELECTRIC FURNACE STEELS

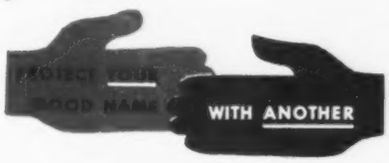


this **factor** figures in your future

Whatever your drive problems, the motor with the Fairbanks-Morse Seal can be an important factor in the future success of your motor-driven equipment.

For example, when you need synchronous machinery, look for the F-M Seal—as have users of over 5,000,000 horsepower of this type of equipment. That Seal is your assurance of pioneered improvements, proved design, quality manufacture and top performance—factors to figure in your future.

When you look for electric motors, look for the Fairbanks-Morse seal. For over 120 years it has stood for the finest in manufacturing integrity—to *all* industry. Fairbanks, Morse & Co., Chicago 5, Illinois.



FAIRBANKS-MORSE

a name worth remembering when you want the best

ELECTRIC MOTORS AND GENERATORS • MAGNETOS • FARM MACHINERY
DIESEL LOCOMOTIVES AND ENGINES • PUMPS • SCALES
HOME WATER SERVICE EQUIPMENT • RAIL CARS

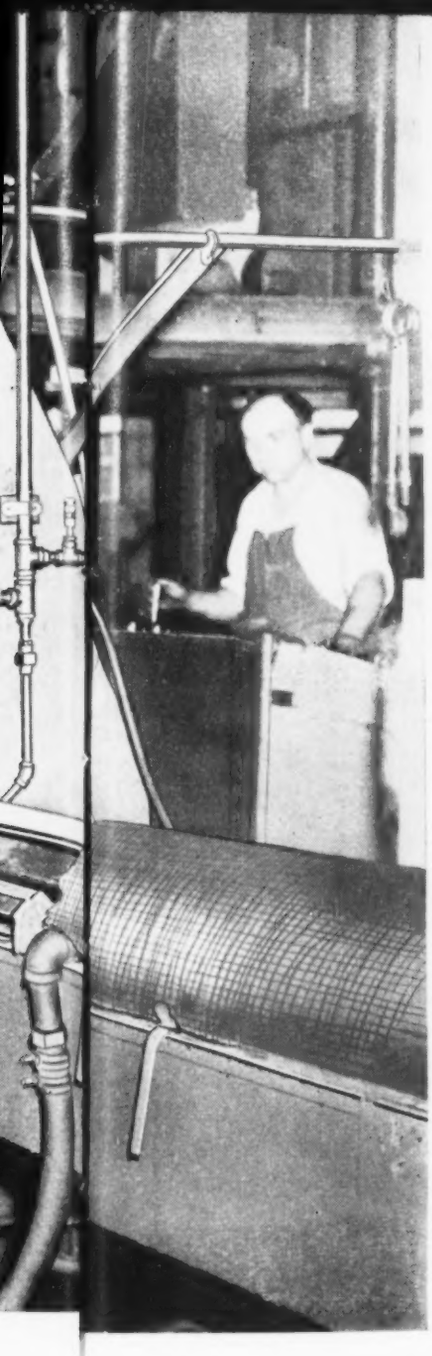
Puts squeeze on hydraulic press maintenance...

Shown above is the 1250-ton hydraulic press used by the Light Metals Corporation of Grand Rapids, Michigan, for extruding variously shaped sections of aluminum. When this press was installed recently, officials gave the important hydraulic oil job to STANOIL Industrial Oil. They based that decision on their own experience with this outstanding multi-purpose oil.

That experience covered over four years' use of STANOIL in the hydraulic system of a 315-ton extrusion press. STANOIL has served continuously in this press without being changed or removed for oil maintenance. The hydraulic oil system has never been cleaned and has remained entirely free from deposits and varnish. Hydraulic operation has been efficient at all times.

The experience of the Light Metals Corporation, and of a host of other midwest manufacturers, is your assurance of STANOIL's ability to reduce to a minimum your plant's hydraulic system maintenance. You can be assured, too, of this versatile oil's ability to provide clean, dependable lubrication for such a variety of equipment as air compressors, reduction gears, electric motors, and auxiliary turbines.

The Standard Oil lubrication specialist in your own locality will be glad to show you operating records covering the many applications of STANOIL Industrial Oil. Phone him at your local Standard Oil (Indiana) office. Or write, Standard Oil Company, 910 South Michigan Avenue, Chicago 80, Illinois.



What's YOUR problem?

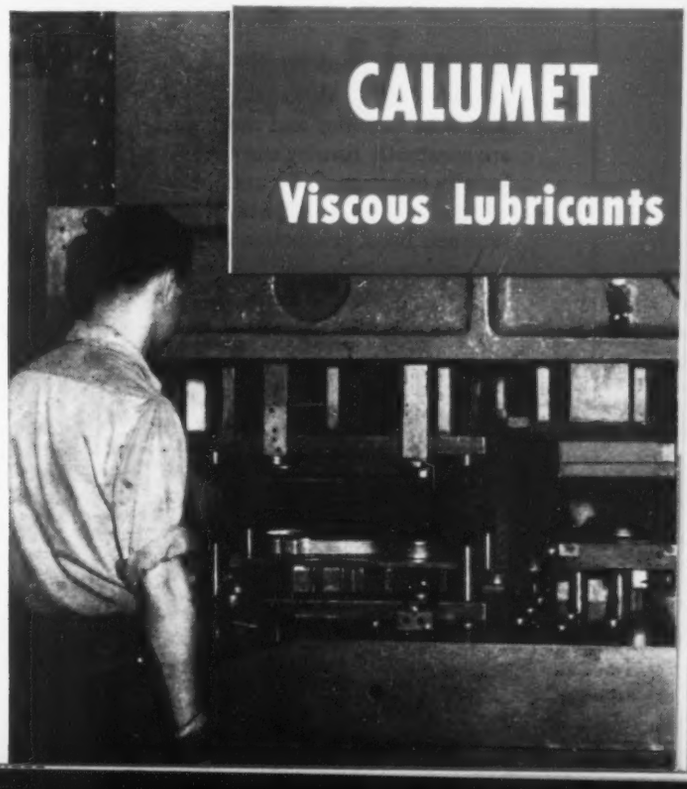
D. R. Clay, of Standard Oil's Grand Rapids, Michigan, office, is the lubrication specialist who has helped Light Metals Corporation keep maintenance of hydraulic units at a minimum through use of STANOIL Industrial Oil.

He is one of many Standard Oil specialists located throughout the Midwest. These men have the practical experience and special training to handle lubrication problems on any type of operation.

Take advantage of the service offered by the lubrication specialist nearest your plant. You can contact him easily by phoning your local Standard Oil Company (Indiana) office.

ONE CUTTING OIL FOR MANY JOBS. Production at a Michigan screw machine products plant includes a wide range of parts made of brass, copper, bronze, aluminum, steel, and stainless steel. STANICUT Cutting Oil 107BC is used across the board. Its use has resulted in consistent fine finish with no troubles from corrosion. Its versatility has made unnecessary the costly use of special cutting oils.

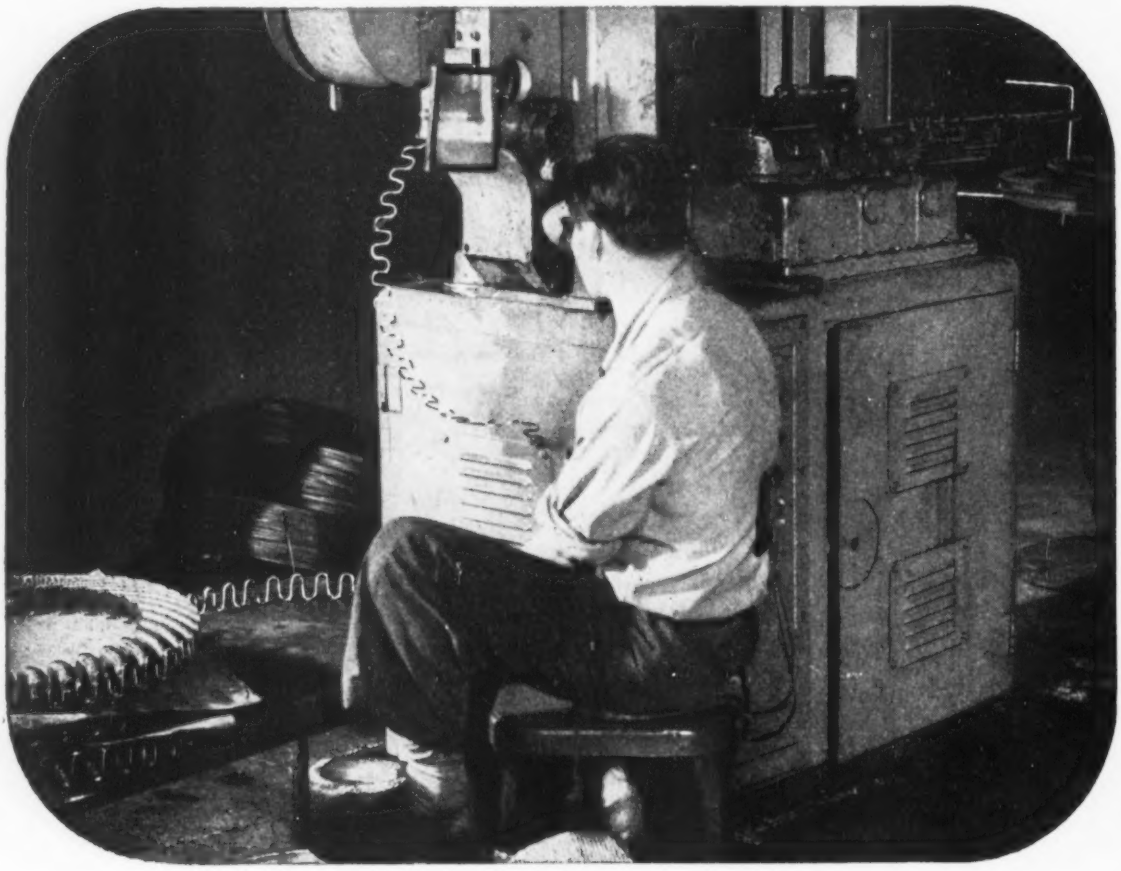
PINS DOWN PRESS LUBRICATION PROBLEM. Lubrication of die set leader pins was a headache for a midwest plant. Replacing a cup grease, CALUMET Viscous Lubricant No. 8X solved the problem. It eliminated scoring and galling of leader pins. It is applied just once a day, shows up well on the pins.



STANDARD

STANDARD OIL COMPANY
(INDIANA)

SPRING WIRE



For uniform quality, we're sure this spring wire is the best we've ever made

ROEBLING is about the largest specialty wire manufacturer in America. And with progressively improved facilities and more positive controls we are constantly turning out wires with a higher uniformity of gauge, finish and mechanical properties.

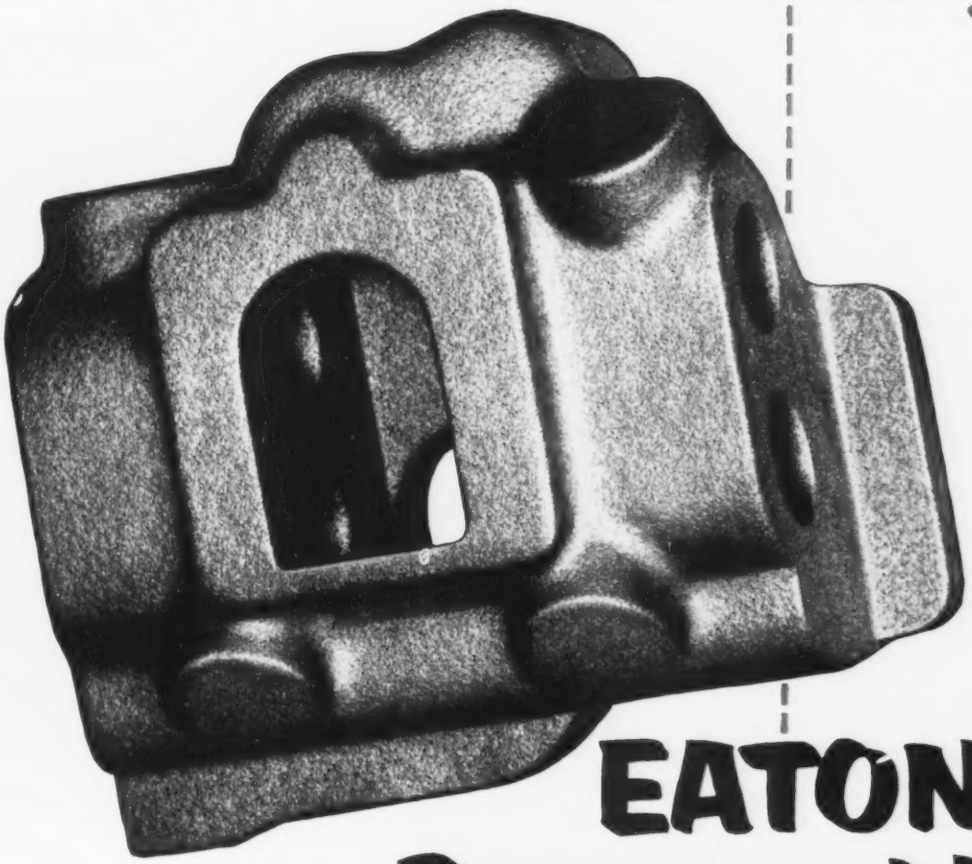
Among these products that save preparation time and boost production for users are mechanical spring wires including hard drawn, soft, annealed or oil-tempered M.B., H.B. and Extra H.B.; music wire; upholsterers' spring wire and valve spring wire...all in a full range of physical properties and finishes.

Reduce your machine shut-downs and step up overall production with the Roebling specialty wire that will meet your most exacting requirements. John A. Roebling's Sons Company, Trenton 2, N. J.

ROEBLING

ATLANTA, 934 AVON AVE • BOSTON, 51 SLEEPER ST • CHICAGO, 5525 W. ROOSEVELT RD • CINCINNATI, 3253 FREDONIA AVE • CLEVELAND, 13225 LAKEWOOD HEIGHTS BLVD. • DENVER, 4801 JACKSON ST • DETROIT, 915 FISHER BLDG • HOUSTON, 6216 NAVIGATION BLVD • LOS ANGELES, 5340 E. HARBOR ST • NEW YORK, 19 RECTOR ST • ODESSA, TEXAS, 1920 E. 2ND ST • PHILADELPHIA, 230 VINE ST • SAN FRANCISCO, 1740 17TH ST • SEATTLE, 900 1ST AVE S. • TULSA, 321 N. CHEYENNE ST • EXPORT SALES OFFICE, TRENTON 2, N. J.

For better Power Steering



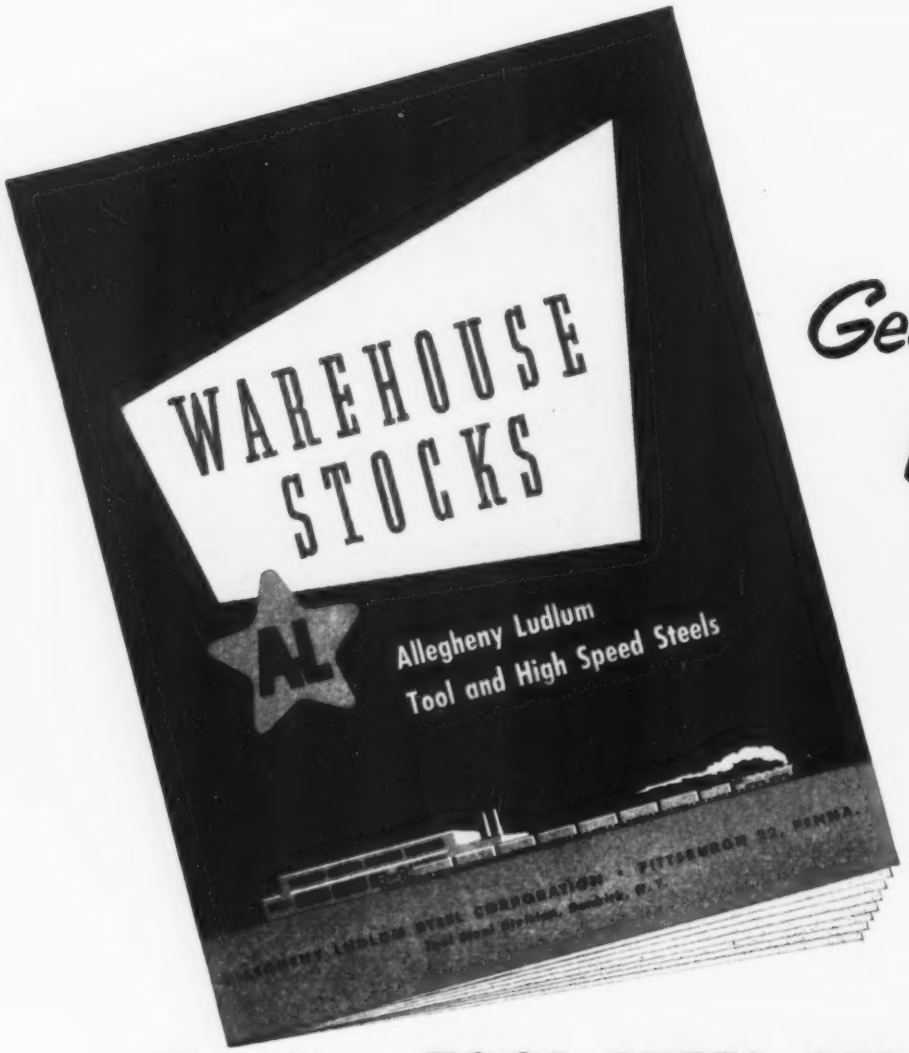
EATON Permanent Mold Gray Iron Castings

Send for your copy of the illustrated booklet, "A Picture Tour of the Eaton Permanent Mold Foundry."

Free machinability
Dense, non-porous structure
Uniform structure throughout the casting
Freedom from leakage under pressure
Machines to high, mirror-like finish
Properly annealed; no growth or distortion after machining

EATON MANUFACTURING COMPANY
CLEVELAND, OHIO
FOUNDRY DIVISION: 9771 FRENCH ROAD • DETROIT 13, MICHIGAN

PRODUCTS: Sodium Cooled, Poppet, and Free Valves • Tappets • Hydraulic Valve Lifters • Valve Seat Inserts • Jet Engine Parts • Rotor Pumps • Motor Truck Axles • Permanent Mold Gray Iron Castings • Heater-Defroster Units • Snap Rings Springtites • Spring Washers • Cold Drawn Steel Stampings • Leaf and Coil Springs • Dynamatic Drives, Brakes, Dynamometers



Get your copy..

WRITE FOR IT TODAY!

Here's a TOOL STEEL STOCK LIST that's really *Clear, Concise* and *Dependable!*

There's an A-L Tool Steel to do each job *best*

The Allegheny Ludlum Tool Steel family includes 37 principal types, covering the high speed, hot work, shock resisting, cold die, and carbon and low alloy steel fields. Let us help you find the best answer to *any* problem that occurs in your production or use of cutting and forming tools.

ADDRESS DEPT. A-35

This 72-page catalog lists the stocks of A-L High Speed and Tool Steels which are constantly maintained in each of 18 warehouses, located at convenient points from coast to coast. In compact, easy-to-follow style, the book gives a complete stock picture, nationwide, of the 15 most widely used types of these steels—each in a full range of standard shapes and sizes—and also includes data on stocks of drill rod, tool bits and Carmet carbide metal blanks and tools.

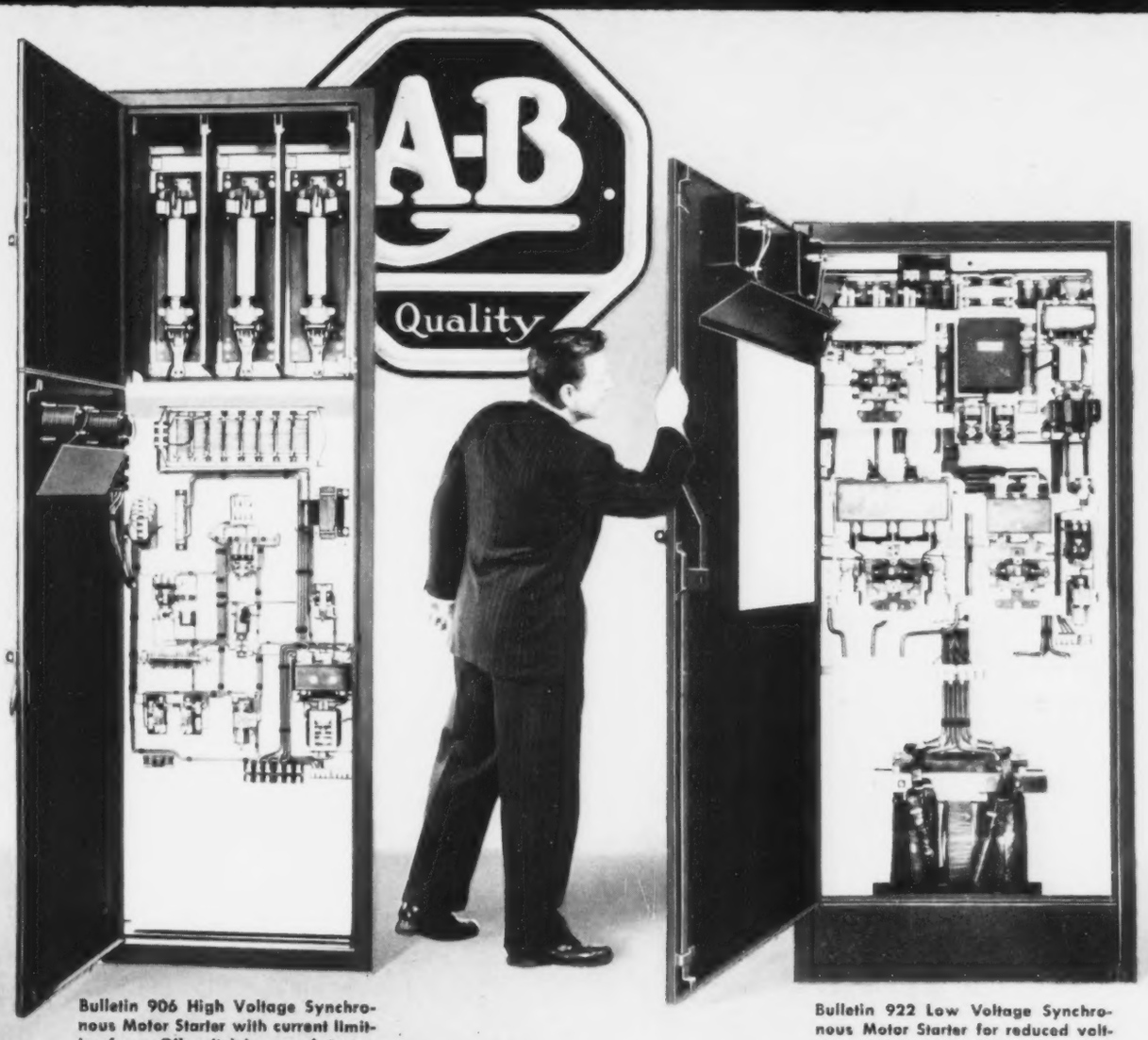
It may be that your requirements call for mill shipments. If so, you can rely on us to schedule material for you without delay. *But*—if you depend entirely or in part upon ordering High Speed and Tool Steels in smaller lots—and want to know where you can get them *quickly*—you'll find A-L's book of "Warehouse Stocks" mighty handy to have in your desk. ● Write for your copy *today! Allegheny Ludlum Steel Corporation, Henry W. Oliver Bldg., Pittsburgh 22, Pa.*

For complete **MODERN** Tooling, call

Allegheny Ludlum

AL
FINE TOOL STEELS
SINCE 1854

W&D 3529



Bulletin 906 High Voltage Synchronous Motor Starter with current limiting fuses. Oil switch in rear of starter.

Bulletin 922 Low Voltage Synchronous Motor Starter for reduced voltage starting. Autotransformer type.

STARTERS FOR BIG MOTORS

Bulletin Number	Type of Motor	Operation	Maximum Horsepower 208-220v	440-550v	2000-2500v	2501-4600v
646	Sq. Cage	Manual	125	250	—	—
726	" "	Automatic	—	—	700	700
740	" "	"	300	600	—	—
741	" "	"	300	600	—	—
742	" "	"	300	600	—	—
746	" "	"	300	600	—	—
747	" "	"	—	—	700	700
904	Synchr.	Manual	125	250	—	—
906	"	Automatic	350*	700*	900*	900
914	"	"	250*	250*	—	—
922	"	"	350*	700*	900*	900

(*) At 100% power factor

The motor starters, shown above, are examples of the many big units in the Allen-Bradley line.

Various types of manual or automatic starters for synchronous motors are available . . . up to 900 hp., 220 to 4600 volts.

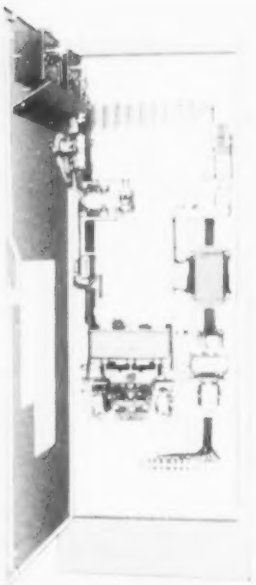
High voltage squirrel cage automatic motor starters are listed up to 700 hp., 2000 to 4600 volts. Relays and contactors are time-tested A-B designs, fully protected when specified, by current limiting fuses.

The A-B Handy Catalog is a convenient manual on motor controls . . . large or small. Write for it, today!

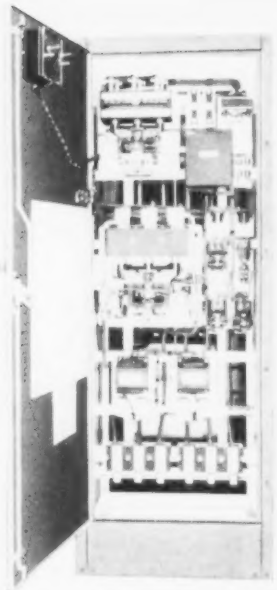
Allen-Bradley Co., 1316 S. Second St.,
Milwaukee 4, Wis.

8-52—MR

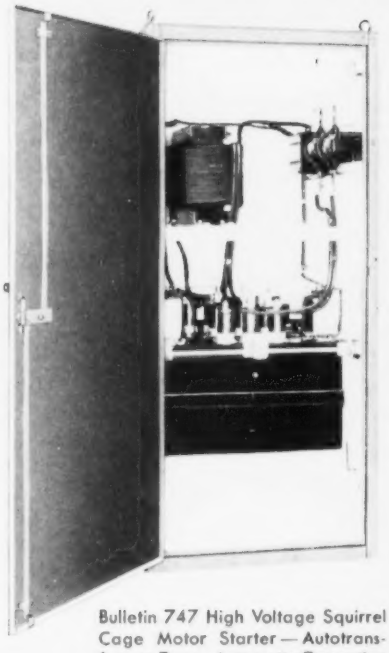
ALLEN-BRADLEY
QUALITY
MOTOR CONTROL



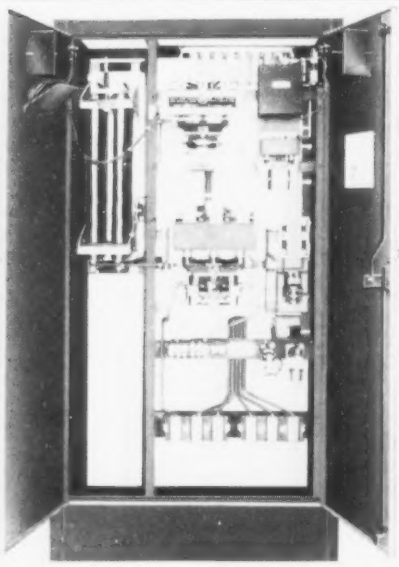
Bulletin 906 Low Voltage Synchronous Motor Starter—Full Voltage Type—Automatic Operation



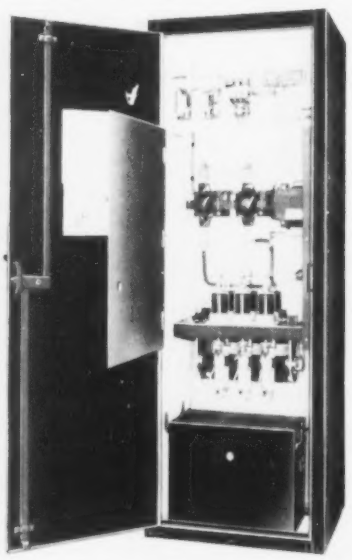
Bulletin 742 Low Voltage Squirrel Cage Motor Starter—Stepless Resistance Type—Automatic



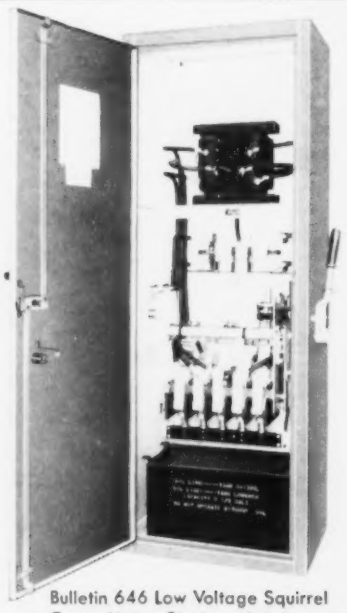
Bulletin 747 High Voltage Squirrel Cage Motor Starter—Autotransformer Type—Automatic Operation



Bulletin 914 Low Voltage Synchronous Motor Starter—Resistance Type—Automatic Operation



Bulletin 726 High Voltage Squirrel Cage Motor Starter—Full Voltage Type—Automatic Operation



Bulletin 646 Low Voltage Squirrel Cage Motor Starter—Autotransformer Type—Manual Operation

Starters for Large High and Low Voltage Motors

The high quality of design and construction, which has made the Allen-Bradley line a leader among motor starters, is built into Allen-Bradley starters for big motors, too.

These big starters can be supplied with all standard accessories, such as contactors for controlling auxiliary equipment, meters and instruments, current limiting fuses, etc. At maximum rating, these starters have an interrupting capacity of 10 times motor full load current.

Standard features of A-B synchronous starters include polarized field frequency relay, automatic resynchronization, thermal overload relays, out-of-step relay, and undervoltage protection. Reduced voltage starting is available either with resistor or autotransformer control.

Standard features of the big A-B squirrel cage motor starters include overload relays. Current limiting fuses are recommended for all high voltage starters.

ALLEN-BRADLEY
QUALITY
MOTOR CONTROL

A-B Quality

Allen-Bradley Company
1316 S. Second Street
Milwaukee 4, Wis.

B-52—MR

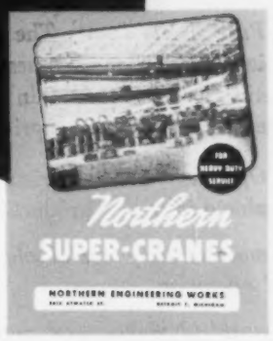
For Tons of EXPERIENCE

53 Years

When you install a Northern Overhead Electric Traveling Crane or heavy duty Hi-Lift Hoist you are utilizing the full benefit of our 53 years experience as crane builders for many of the most efficiently operated and competitive companies in American industry.

One of these companies has installed over 700 Northern Cranes in its many plants for a wide range of material handling usage — adding up to an amazing tonnage in capacity, and in experience!

It takes the best experience available to tool properly to remain competitive today. Northern Cranes can safely assure you a satisfactory, dependable, long-term tooling investment based on tested, seasoned experience.



Write for new Super-Crane Bulletin No. SE-108-161 for information and major specification details of Northern Super-Cranes and Super-Trolleys.

NORTHERN ENGINEERING WORKS

General Offices: 2615 Atwater St., Detroit 7, Michigan

BUILDERS OF CRANES AND HOISTS EXCLUSIVELY

Major Tin Plate Producer Steps Up Production 15% Using PALMOSHIELD

Sets production records using domestic Palmoshield in place of imported palm oil

After tests covering a number of years, a leading steel company adopted Palmoshield as a replacement for palm oil in cold rolling operations. Recently over a run of 20 consecutive shifts, production was stepped up 15% over the average output with imported oil. This increase was made with no additional investment, no increase in labor force, no extra machines and no changes in mill operation. Yet 115 tons of steel were rolled for every 100 before.

Two Mill-Tested Benefits

Actual mill experience in dozens of plants has proven these advantages of Palmoshield:

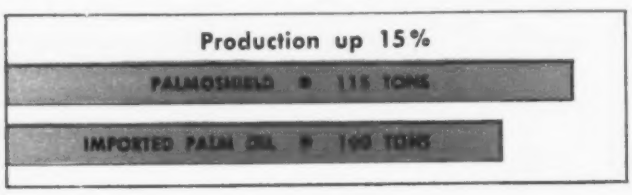
To Purchasing Agents. The price of Palmoshield is not artificially controlled. It rises and falls freely with the domestic fat market. Within the past year users have received several voluntary price cuts.

To Operators. Mill experience indicates that the use of Palmoshield improves production.

Palmoshield requires absolutely no changes in rolling mill operation.

Palmoshield makes steel quicker to gauge and shape.

Water break tests show that Palmoshield washes grease-free under conventional cleaning operations.



Quick Acceptance by steel producers

Nearly two-thirds of the major tin plate mills in this country and Canada are now using Palmoshield either in regular mill operations or for on-the-job-test runs. One company using Palmoshield for the first time was only 10 tons shy of the daily record. Another broke the single-shift record. And still another broke both 8-hour and 24-hour records.

4 Advantages of Palmoshield

Palmoshield is produced in the heart of the steel industry. Users are not dependent on overseas shipment.

Palmoshield is made from domestic materials freely available in sufficient quantities to supply all American steel production.

Palmoshield need not be stockpiled by the user, yet it does not deteriorate in storage.

Palmoshield is subject to exact chemical control. Free fatty acid content can be controlled to within ½%.

Can Palmoshield step up your production?

On request an Ironsides representative will give you facts on Palmoshield to help you set up a test program in your mill.

Palmoshield is available for same-day shipment in 55-gallon drums and tank car lots. For full information write The Ironsides Company, 270 West Mound Street, Columbus, Ohio.

SPECIAL LUBRICANTS and PRESERVATIVES

IRONSIDES SHIELD PRODUCTS PALMOSHIELD

nills in this
ld either in
runs. One
e was only
e the single-
our and 24-

eel industry.
t.

erials freely
ll American

user, yet it

ontrol. Free
½%.

on?

ill give you
program in

oment in 55-
information
ound Street,

IELD

IRON AGE

HEAVY PLATE LEVELERS

★

ELECTROLYTIC COATING EQUIPMENT

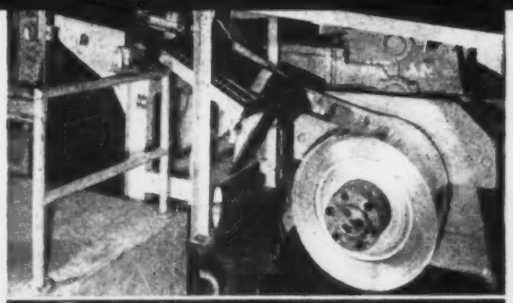
★

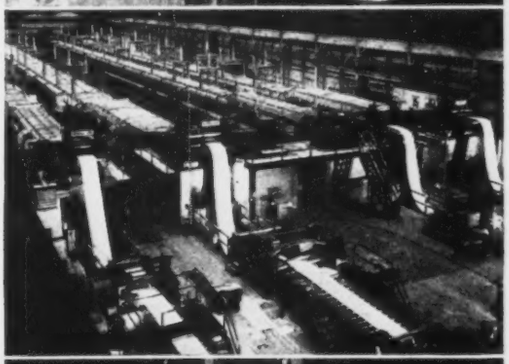
WEAN VACUUM CLIP SHEET and PLATE LIFTERS

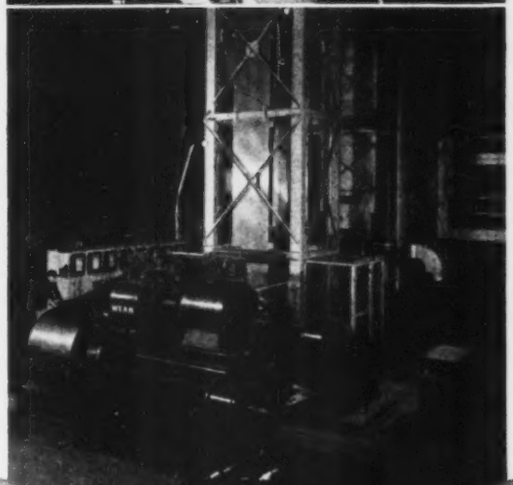
★

BONDERIZING EQUIPMENT

☆







HI-SPEED SHEET and TIN MILL SHEAR LINES

★

STAINLESS STEEL PROCESSING LINES

★

CONTINUOUS STRIP PICKLING, SLITTING, SIDE TRIMMING and RECOILING LINES

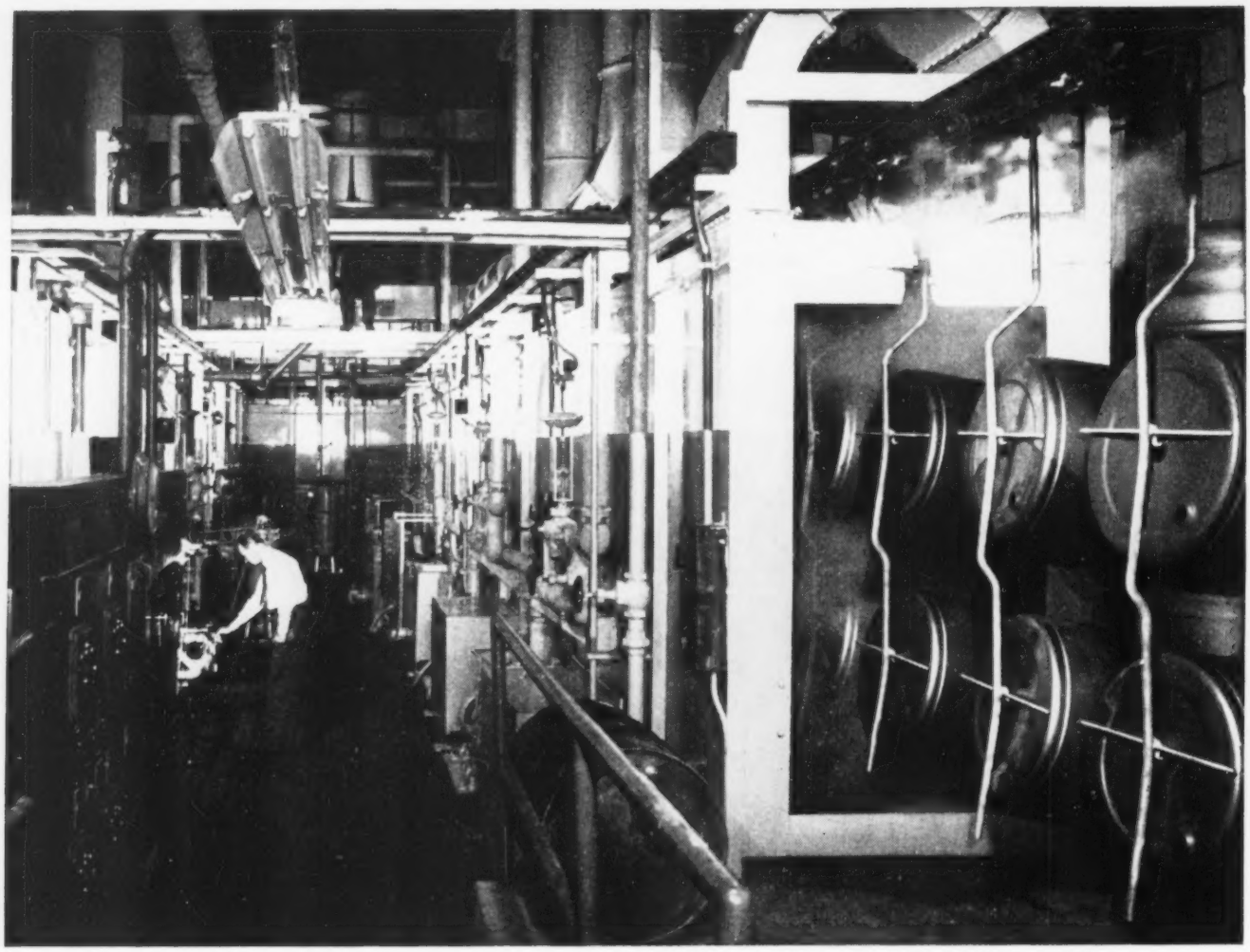
☆

The WEAN

ENGINEERING COMPANY Inc.

WARREN, OHIO

SPECIALISTS IN SHEET, TIN AND STRIP MILL EQUIPMENT



Choose the right cleaner for your spray wash Operations

PENNSALT CLEANERS designed to keep pace with Mechanized Cleaning Production

You will agree, no doubt, that mechanized, high speed production of finished metal parts is here to stay. And one of the mainstays of this kind of production is the continuous spray-washing machine.

Pennsalt has been at the fore in developing and supplying the exact cleaner for a given situation in any number of spray-cleaning needs. For instance: steel, brass, copper, aluminum . . . removing cutting oils, quench oils, drawing compounds, general soils.

Pennsalt Metal Processing men are trained to serve *your* requirements right in the plant. We've got the products (see list below), and we've got the technical service you want. To get either, call or write Metal Processing Dept., Pennsylvania Salt Manufacturing Company, *East:* 1000A Widener Building, Philadelphia 7, Pa., *West:* Woolsey Building, 2168 Shattuck Ave., Berkeley 4, Calif.

Pennsalt Chemicals

A BETTER START FOR YOUR FINISH

PENNSALT CLEANER 30 / **PENNSALT CLEANER 32** — concentrated, anhydrous alkalies based on *fused* ingredients, full of "mileage" and soil-suspending power.

PENNSALT CLEANER A-10 — for aluminum and other non-ferrous metals. Efficient, won't etch or stain light metals.

PENNSALT CLEANER EC-51 — Emulsion cleaner — does a superior spray cleaning job, helps make alkaline cleaners go further. EC-51 is a new *rust-inhibiting* cleaner for use in spray cleaning lines where the processing cycle is interrupted.

Advertisement

ELECTROMET Data Sheet

A Digest of the Production, Properties, and Uses of Steels and Other Metals

Published by Electro Metallurgical Company, a Division of Union Carbide and Carbon Corporation, 30 East 42nd Street, New York 17, N. Y. • In Canada: Electro Metallurgical Company of Canada, Limited, Welland, Ontario

CHROMIUM...key metal for strength, corrosion resistance, and heat resistance

Chromium is one of the most important alloying elements in iron and steel metallurgy since it markedly improves certain chemical and physical properties.

Increases Strength

The strength of steels is greatly increased by chromium because it retards the transformation of certain constituents during rapid cooling.

This makes it possible to obtain great depth of hardness in high-carbon steels, toughness in structural steel, and high strength and ductility in heavy sections. Chromium also increases resistance to shock by refining the grain of the steel.

Of all the alloying elements, chromium is probably the least expensive for increasing the tensile strength of steel. Additions of as little as 0.25 to 1.25 per cent chromium will increase the chill and hardness

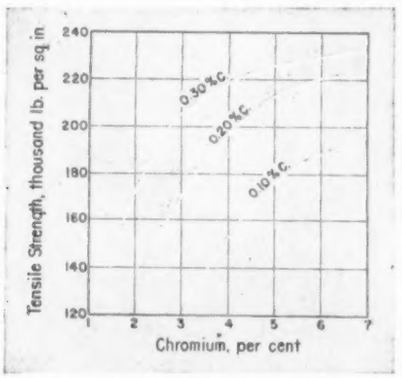


Fig. 1. Chromium increases the tensile strength of air-cooled steels of varying carbon content.

of the steel, as well as the tensile strength.

In copper, aluminum, and other nonferrous alloys, chromium provides increased strength, also.

Imparts Corrosion Resistance

Commercially, chromium is added to steel and iron in amounts up to 30 per cent for the purpose of improving corrosion resistance.

In general, as the chromium content is increased with a given carbon content, the resistance of the steel to corrosive media becomes greater. The well-known "stainless" steels resist corrosion because substantial percentages (usually 12 per cent or more) of chromium are present.

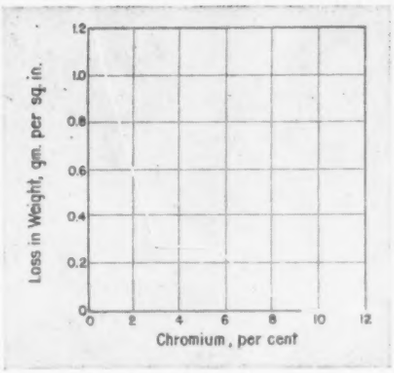


Fig. 2. Results of atmospheric corrosion tests on low-carbon steels of different chromium contents after 10 years of exposure to an industrial atmosphere.

Improves Heat Resistance

In both cast iron and steel, chromium provides good resistance to deterioration from heat. The use of chromium-alloyed iron and steel where high temperatures are encountered, for example, helps to prevent oxidation, which would ruin equipment. As little as 1 to 2 per cent chromium is added to cast iron to improve oxidation resistance and reduce growth of grate bars subject to high temperatures. Oxidation resistance improves progressively as the chromium is increased. Steels containing as little as 5 per cent chromium show good life at temperatures up to 1200 deg. F. For higher temperatures, appropriate steels of higher chromium content may be selected. Steels containing 25 to 28 per cent chromium give satisfactory service at temperatures up to 2100 deg. F.

Alloy cast irons with 15 to 30 per cent chromium are commonly used for applications requiring resistance to severe heat and abrasion.

In non-ferrous alloys, also, chromium is an important constituent for heat and corrosion resistance. It is used in the production of non-ferrous metal-cutting tools, chromium bronzes, and electrical resistance alloys.

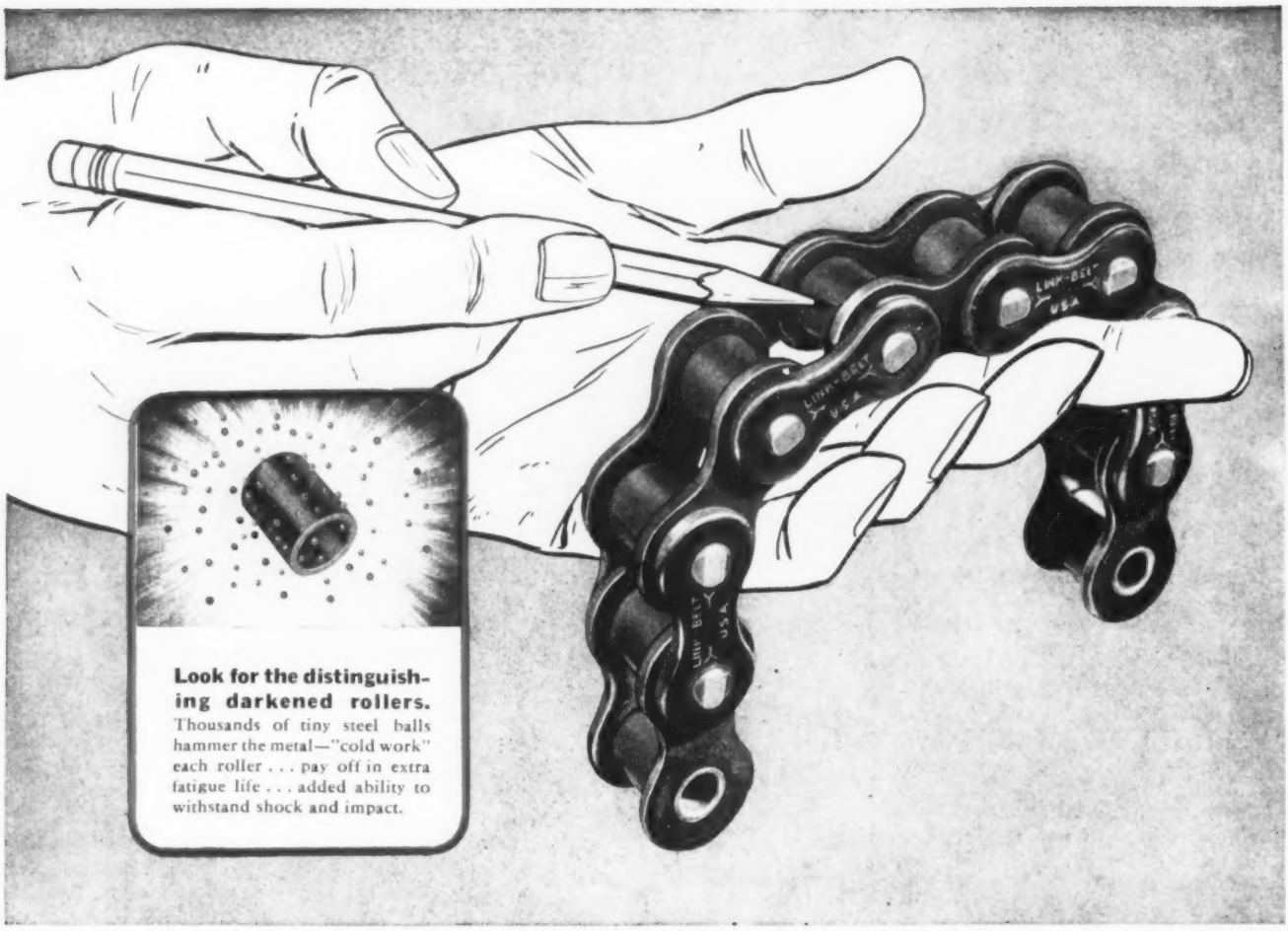
Available Alloys

Chromium is produced by ELECTROMET in the forms listed below which are suitable for every use of the iron, steel, and nonferrous metal industry.

"EM," "Electromet," and "SM" are trade-marks of Union Carbide and Carbon Corporation.

Alloys of Chromium and Their Uses

Low-Carbon Ferrochrome	For production of corrosion- and heat-resistant steels, commonly known as the "stainless steels," as well as special high-temperature alloys in which a low carbon content is desirable.
High-Carbon Ferrochrome	For production of chromium-bearing steels that do not require low percentages of carbon. Also used for adding chromium to cast iron.
Nitrogen-Bearing Ferrochrome	For reducing grain size and improving physical properties of high-chromium steels.
"EM" Ferrochrome-Silicon	Used in the production of stainless steels for adding chromium to the bath, and for reducing oxidized metals in the slag back into the bath.
"EM" Ferrosilicon-Chrome	Readily soluble material for making either furnace or ladle additions of chromium to steels.
"SM" Ferrochrome	Readily soluble material for making chromium additions to steel or cast iron in either the furnace or the ladle.
Foundry Ferrochrome	Especially for use in making readily soluble ladle additions of chromium to improve composition and properties of cast iron.
Chromium Metal	For use in non-ferrous chromium-bearing alloys, such as electrical resistance alloys, high-temperature and corrosion-resistant alloys, metal-cutting tools, chromium bronzes, and certain high-strength aluminum alloys.
"EM" Chromium Briquets	For adding chromium to cast iron in the cupola.



Look for the distinguishing darkened rollers. Thousands of tiny steel balls hammer the metal—"cold work" each roller . . . pay off in extra fatigue life . . . added ability to withstand shock and impact.

It's the SHOT-PEENED rollers that give your roller chain extra life!

. . . one of the extra-wear features you get with every LINK-BELT Roller Chain

POWER-TRANSMISSION engineers and metallurgists agree—shot-peened rollers mean longer roller chain life. That's just one of the engineering extras you get with Link-Belt Precision Steel Roller Chain. Another is Link-Belt's exclusive lock-type bushing.

Remember, too, Link-Belt's rigid material selection and controlled heat treating assure chain uniformity . . . no weak members.

Link-Belt builds a complete line of roller chain—single or multiple widths in ⅜″ through 3″ pitch; and double pitch, 1″ through 3″. Submit your chain problems to the Link-Belt office near you.

No partial bearing here —bushing fits securely

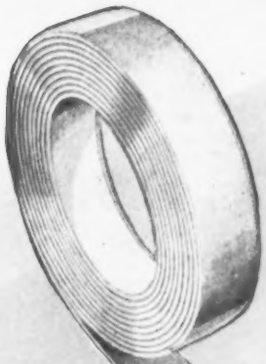
Lock-type bushings increase ability to withstand severe operating conditions

A special manufacturing process securely locks the inside sidebars on the bushing, preventing lateral movement of the sidebars and eliminating a common cause of stiff chains. This Link-Belt development is applied on roller chains through 1″ pitch and double pitch roller chains through 2″ pitch.

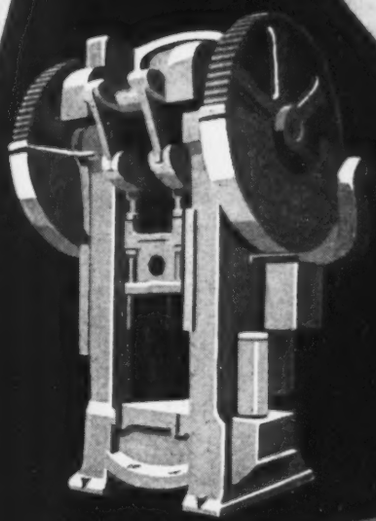
LINK-BELT

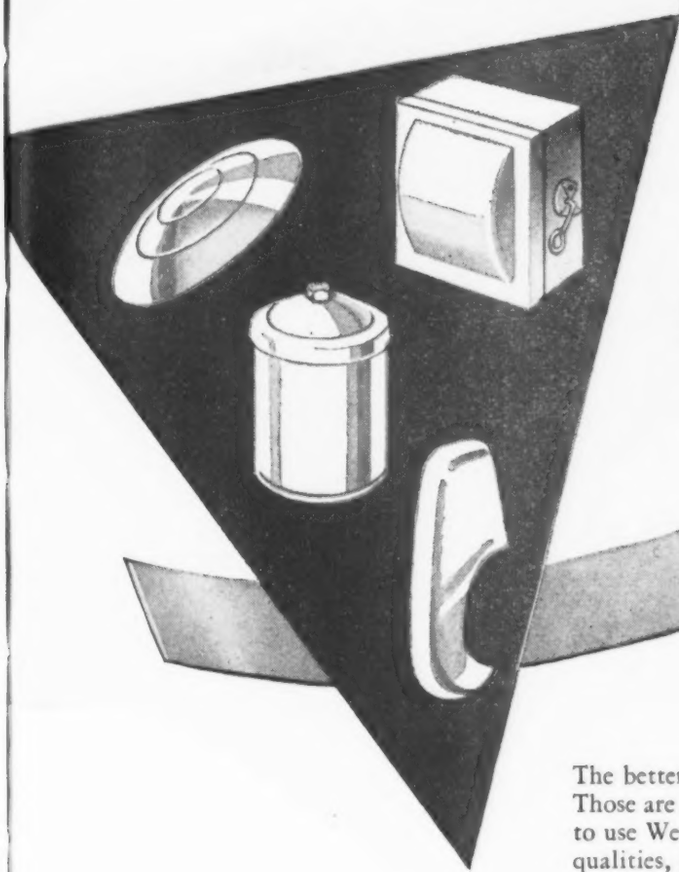
Precision Steel Roller Chain

LINK-BELT COMPANY: Chicago 9, Indianapolis 6, Philadelphia 40, Atlanta, Houston 1, Minneapolis 5, San Francisco 24, Los Angeles 33, Seattle 4, Toronto 8, Springs (South Africa), Sydney (Australia). Offices, Factory Branch Stores and Distributors in Principal Cities. 12,695



for better output-





WEIRTON
STRIP STEEL

The better the strip, the better the product—and the easier production. Those are two important reasons why manufacturers find it advantageous to use Weirton cold-rolled strip steel. Its excellent drawing and forming qualities, its constant uniformity, promote plant efficiency and economy by reducing spoilage and tool expense. In short—Weirton strip boosts both quantity and quality.

WEIRTON STEEL COMPANY
WEIRTON, WEST VIRGINIA

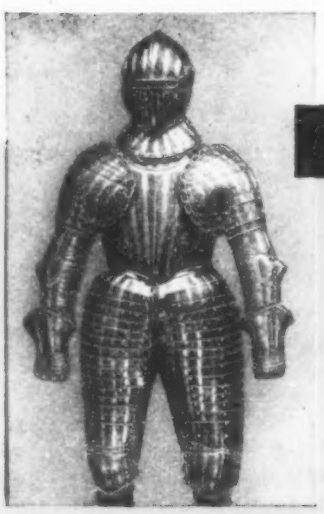
NATIONAL STEEL CORPORATION

ARMORED MITE . . . versus . . .

The mediaeval knight, his armor polished and shining, must have made a colorful sight as he charged through the castle gate to meet the foe in head-on battle. His plate armor was ingeniously designed to protect him from sword and spear, battle axe and hammer. The Knight whose armor provided the *best protection* and offered the *greatest mobility* usually returned the victor. History tells us that metal craftsman of the Middle Ages* vied with one another to develop better protection for their warriors. Then as today, applied talents in the design and metallurgy of armor plate proved the decisive factor in combat.

Here at Standard Steel Spring Company we have mobilized a great group of fully staffed and equipped plants to make essential armor plate for tanks. We engineer the parts, tool for their most economical production, work with our subcontractors in closest contact with procurement, production and inspection.

Now from these centrally coordinated facilities a steady flow of flat or formed, fully machined tank components is reaching all major producers. If you have a need for armor plate or are interested in a redesign program for greater economy or speedier production, your inquiries are invited.



***ARMOR AS IT WAS**

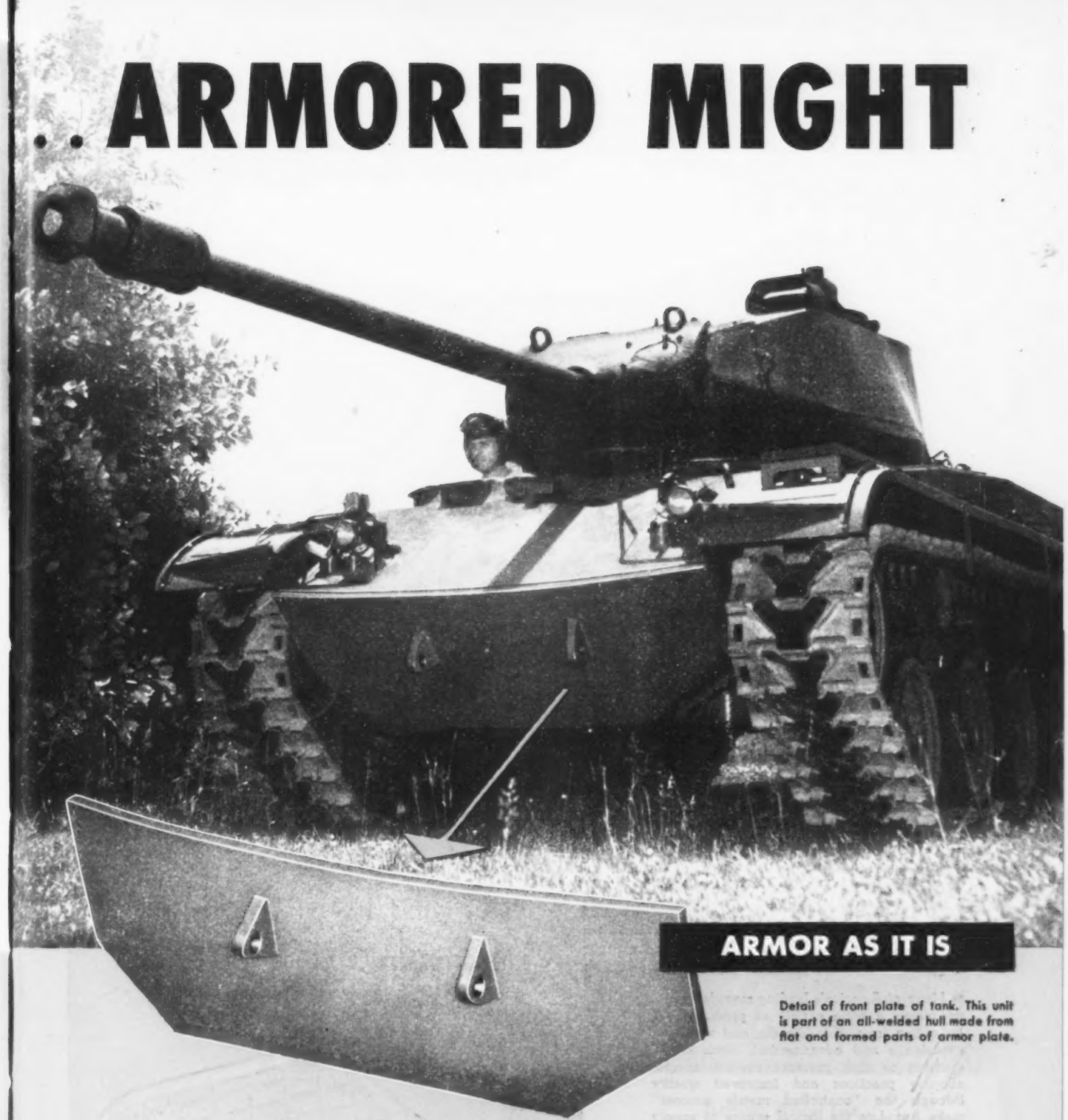
One historian describes the Middle Ages as the period between the civilization of the ancients and that of the printing press. Then "Knighthood was in Flower" throughout England and the Continent. The suit of armor illustrated was worn in the 16th century; made probably in Milan or Brescia. Note the ingenious construction involving overlapping scales that provided full protection while permitting the knight to bend his arms and legs in battle.

Standard Steel Spring Company

ARMOR PLATE DIVISION PENOBSCOT BLDG. DETROIT, MICHIGAN

ARMOR PLATE

. . . ARMORED MIGHT



ARMOR AS IT IS

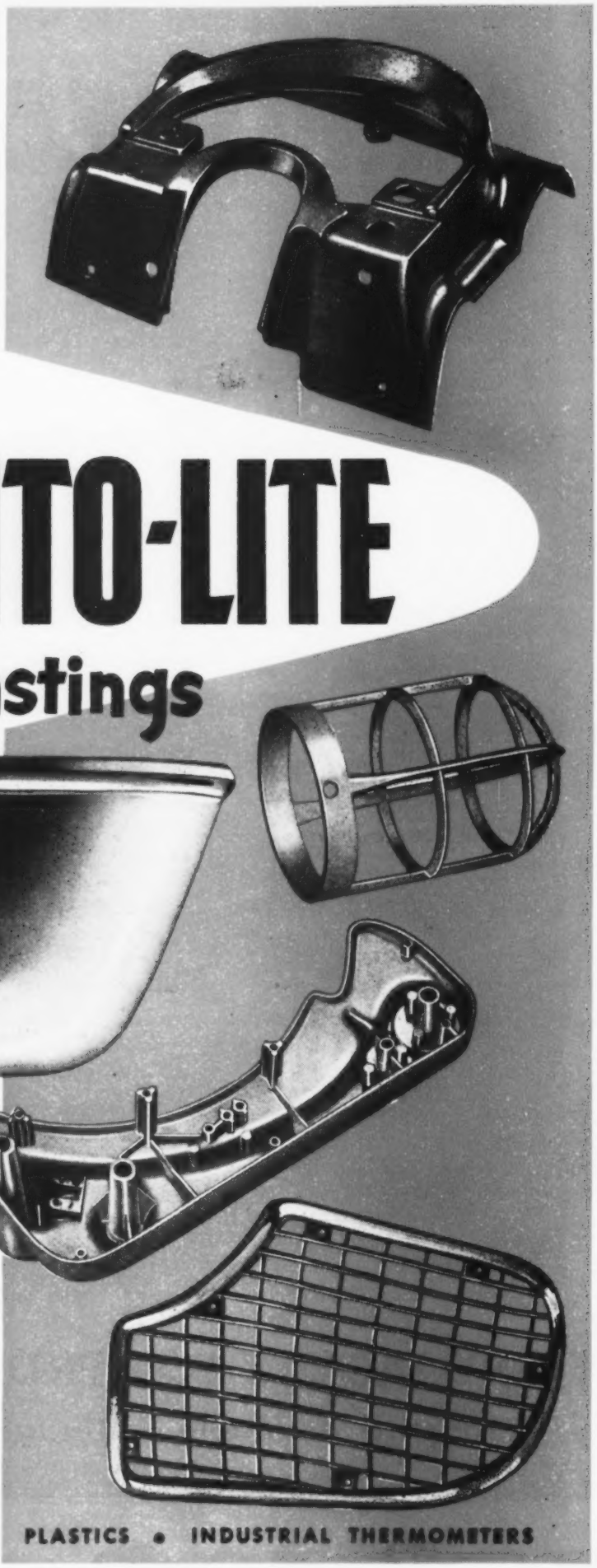
Detail of front plate of tank. This unit is part of an all-welded hull made from flat and formed parts of armor plate.

EVERY FACILITY FOR PRODUCING ARMOR PLATE

Ready to Assemble in Gauges from ¼" to 4" Inclusive

—for Ordnance

You're always right with AUTO-LITE Die Castings



● Many of America's leading manufacturers, producing a wide variety of products, are benefiting from Auto-Lite die cast research, experience and advancement. Such developments as high pressure casting, special alloying practices and improved quality through the "controlled metals process" make Auto-Lite the logical source of supply for precision die castings. Address inquiries to:

THE ELECTRIC AUTO-LITE COMPANY
Die Casting Division
Woodstock, Illinois

Lockland Division, Cincinnati 15, Ohio

600 So. Michigan Ave.
Chicago 5, Illinois

723 New Center Bldg.
Detroit 2, Michigan

Tune in "Suspense" . . . CBS Radio Mondays . . . CBS Television Tuesdays

DIE CASTINGS • WIRE & CABLE • PLASTICS • INDUSTRIAL THERMOMETERS

INTERNATIONAL HARVESTER

(SPRINGFIELD OHIO PLANT)

SPEEDS GRINDING OPERATIONS

WITH

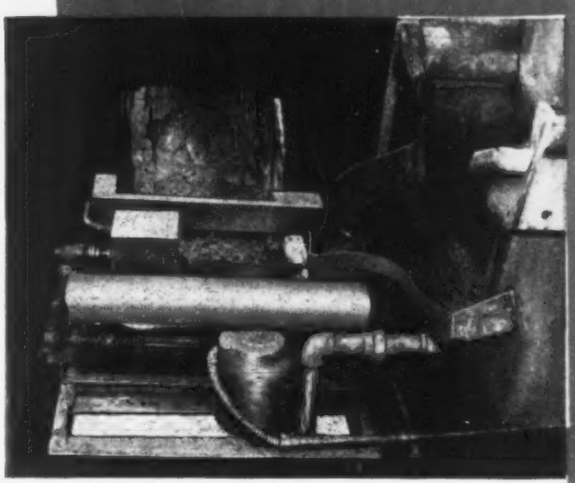
Delpark FILTERS

The DELPARK filter shown at the right supplies clean, swarf-free coolant for the free-cutting wheel of a Blanchard #18 Grinder.

Filtering the coolant removes the cast iron grindings, filters out wheel particles, assures scratch-free parts, grinding accuracy, increased production.

The swarf deposited out is 1½ inches thick on the filter material. In the course of an 8-hour day, 3 yards of filter material are used. The cost is negligible. At the cost of pennies per day, hours are gained, machine efficiency increased, rejection rate reduced and dollars are saved.

There's proof here, as in hundreds of other industrial plants, that DELPARK filters can serve your plant with greater savings and efficiency.



Longer Wheel Life

Uniform Coolant Temperature

Lower Rejections

No Down-time for Desludging Reservoir

Assures a Cleaner, Free-Cutting Wheel

WRITE FOR MORE COMPLETE INFORMATION IN OUR NEW BULLETIN

Delpark

INDUSTRIAL FILTRATION

Backed by More Than 30 Years Experience in Industrial Filtration

PATENTS PENDING

INDUSTRIAL FILTRATION COMPANY BOX **LEBANON, INDIANA**

NEW

Fast Arc Blowout

ALLIS-CHALMERS Mill Type 260 DC CONTACTOR

Two Type 260 DC Contactors, 150 amp, single pole, normally open, with auxiliary switch. One arc chute has been removed to show control detail. Type 260 DC Contactors with the new Arc Centering Feature are rated 600, 300 and 150 amps at 600-volt maximum.

- Speeds Arc Interruption
- Extends Contact and Chute Life

THIS NEW HEAVY DUTY CONTACTOR offers an *entirely new* principle of arc interruption . . . developed by Allis-Chalmers engineers to meet the exacting needs of industry.

Contact and arc chute life have been greatly extended by an *arc centering blowout*. In centering the arc, increased blowout action and fast interruption results from a combination of thermal convection and magnetic action. Contact erosion is reduced and carbonization is minimized.

Other advantages of the Mill Type 260 DC Contactor include: accessible construction for easy maintenance; ROLLING contact action with no destructive scuffing; design simplicity which has eliminated troublesome linkages, arms and pivots.

The Type 260 DC Contactor featuring the new arc interruption principle has been designed and built to steel mill engineers' specifications. Years of field and factory tests have proved this heavy duty contactor far exceeds NEMA requirements . . . have established it as an efficient, trouble-free performer under the most severe operating conditions. Call your nearby Allis-Chalmers District Office or write to Allis-Chalmers, Milwaukee 1, Wisconsin. Ask for Bulletin 14B6505A.

A-3909

How Arc Interruption Principle Works

Arc Chute Assembly consists of triangular metal plates with U-shaped segments mounted alternately. Plates are insulated from each other and are placed at right angles to circumference of contact travel.

Metallic segments act as individual blowout coils.

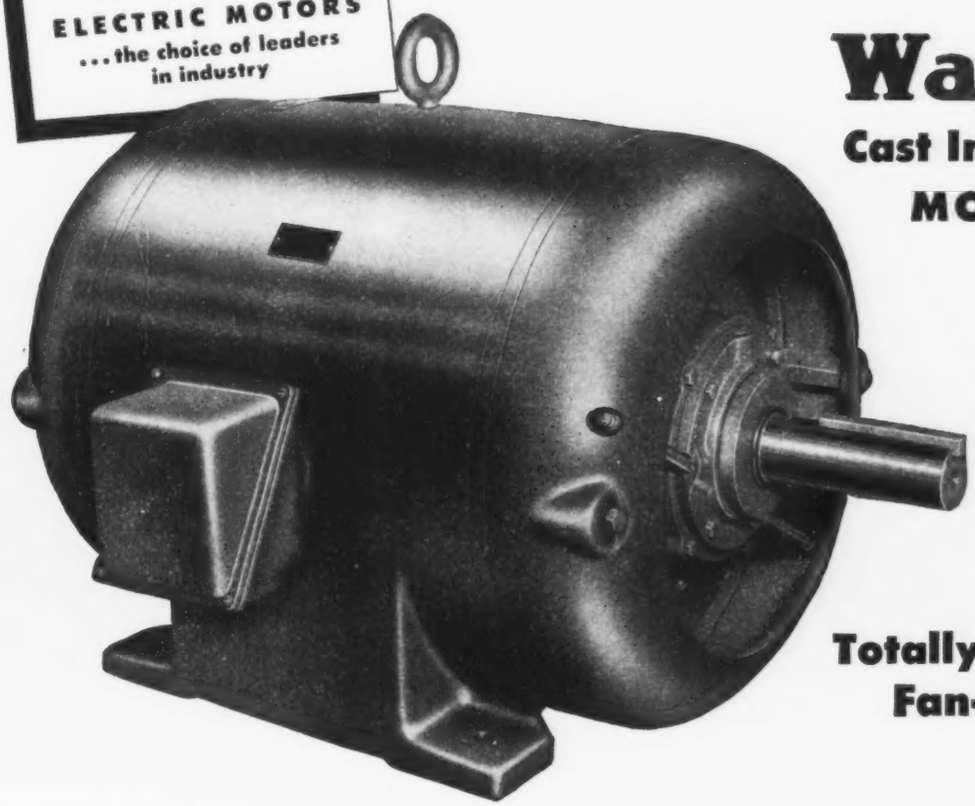
Arc is forced upward along arc runner by blowout coil and impinges on metal segment of arc chute.

As contacts separate further, arc is stretched across an increased number of segments.

Arc rises quickly due to thermal and magnetic action of each individual metal segment.

ALLIS-CHALMERS

Wagner
ELECTRIC MOTORS
...the choice of leaders in industry



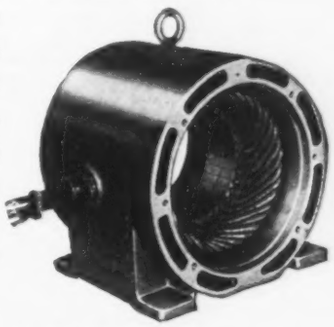
Wagner
Cast Iron Frame MOTORS

Totally-enclosed Fan-cooled

Built for use in corrosive atmospheres

Wagner Cast Iron Frame Motors are designed to provide the corrosion resistance demanded by applications in chemical plants or in other applications where protection against corrosion is required. They feature completely protected laminations . . . special varnish treated windings . . . a cast iron, gasket-sealed conduit box . . . a running shaft seal . . . and are totally-enclosed and fan-cooled for complete protection against acids and alkalies present in the atmosphere in the form of dust, fumes or moisture. The photo at right illustrates the rugged, one piece cast iron frame, showing openings for ventilation.

Where additional protection against explosive atmospheres is desired, an explosion-proof design (type JP) is available. Both the standard (type EP) and the explosion-proof types are built in ratings from 2 to 250 hp., with either normal or high torque characteristics. Non-ventilated 1 and 1½ hp. motors also available. Wagner Bulletin MU-132 gives complete information on these corrosion-resistant motors. Write for your copy today.



WAGNER ELECTRIC CORPORATION
6403 Plymouth Ave., St. Louis 14, Mo., U.S.A.

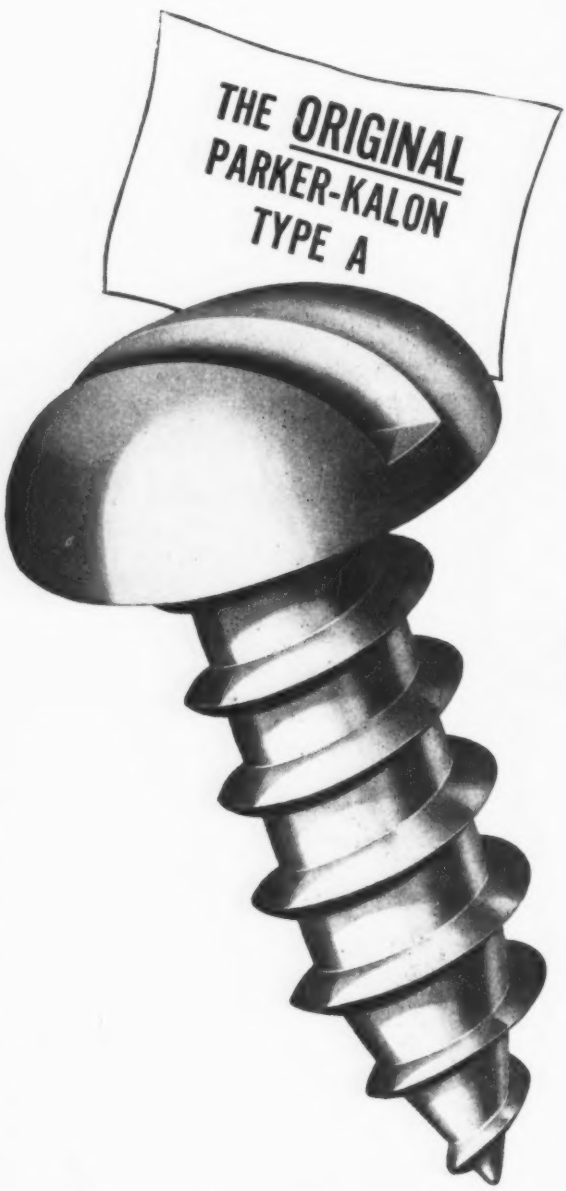
Wagner Electric Corporation
EST. WE 1891

ELECTRIC MOTORS • TRANSFORMERS • INDUSTRIAL BRAKES
AUTOMOTIVE BRAKE SYSTEMS — AIR AND HYDRAULIC

BRANCHES IN 32 PRINCIPAL CITIES

M52-18

THE FIRST SELF-TAPPING SCREWS STILL WITH ASSEMBLY EXPERTS



"Screws are something like people. If they lose their heads under pressure—if they turn out to be 'softies' —if they don't 'square up', they can slow up a job for sure. We avoid that by specifying Parker-Kalon."

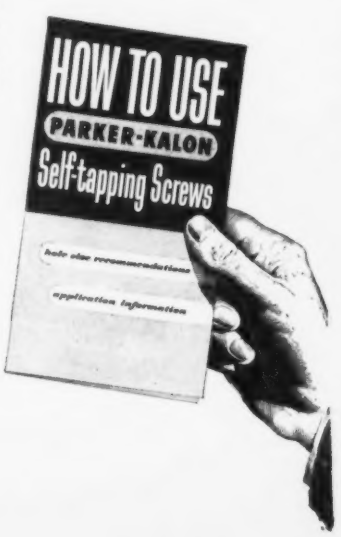
"P-K has developed many types of Self-tapping Screws, and their long experience covers millions of applications. For that reason we know their recommendations will fit the right type screw to the job, and not fit the job to some particular type of screw."

"There's a 'best buy' in everything, and in Self-tapping Screws we've found it's Parker-Kalon. Hardness and toughness are balanced just right, size is accurate, and threads are sharp and clean from head to tip. And that saves time on the assembly line . . . plenty!"

PROMPT DELIVERIES NOW FROM YOUR LOCAL P-K DISTRIBUTOR

GET THIS BOOKLET

Tells "where to use what" type of screw in all types of metals and plastics, gives hole-size recommendations and other information. Ask your P-K Distributor for Form 480. Or, write Parker-Kalon Corporation, 200 Varick Street, New York 14.



PARKER-KALON®

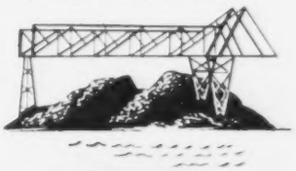
The Original **SELF-TAPPING SCREWS**

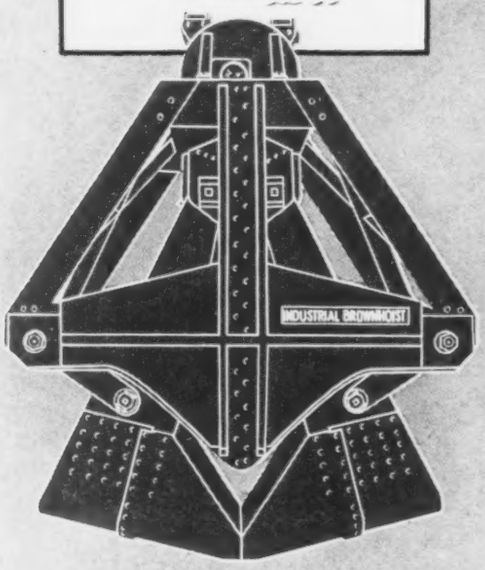
AND OTHER FASTENING DEVICES

BROWNHOIST

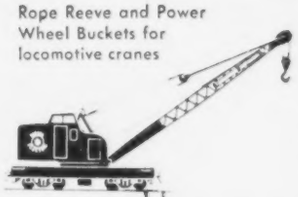
ALSO BUILDS BETTER BUCKETS

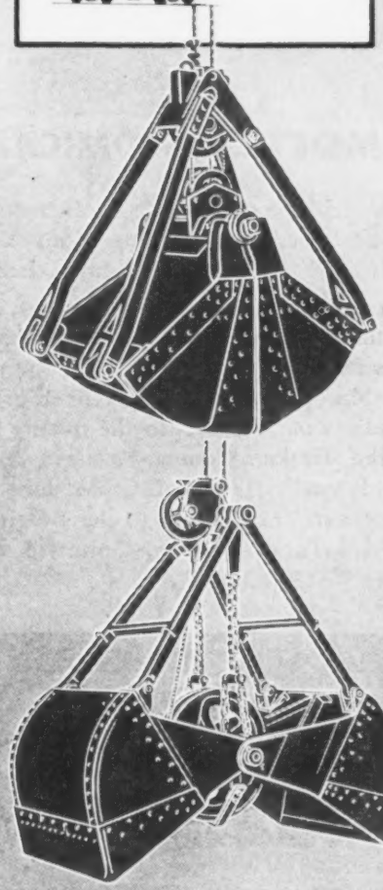
Link Type Buckets for boat unloaders, bridge cranes, fast plants





Rope Reeve and Power Wheel Buckets for locomotive cranes

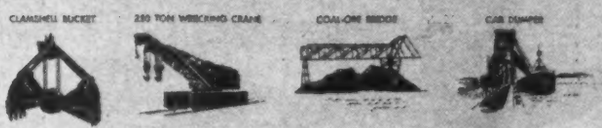




164

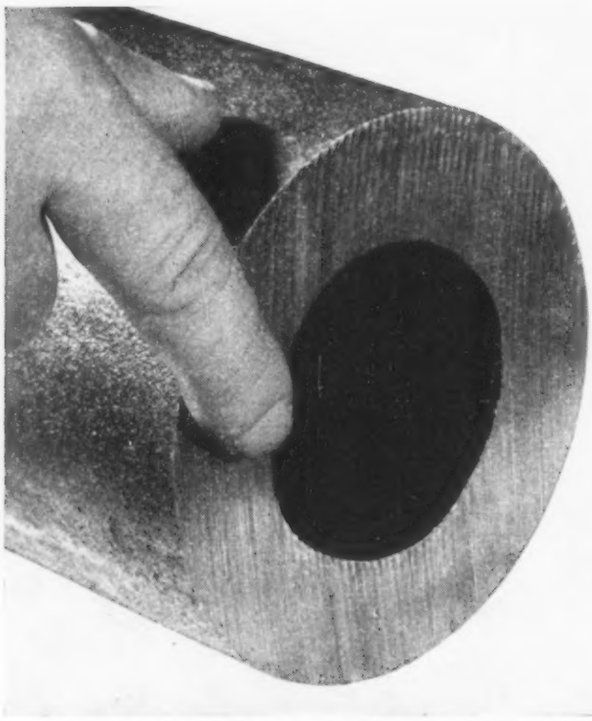
Brownhoist Buckets are designed for specific jobs and especially engineered to meet the toughest materials handling requirements. They take deep, full capacity bites that move more materials per lift, thus making possible considerable savings in man-hours and production time. They are built for endurance and dependability, the same qualities that have accounted for Brownhoist leadership in the bulk materials handling field for more than three quarters of a century. Railroads, steel mills and dock operators who are loading and unloading coal, ore, slag or other bulk materials will find it pays to discuss their requirements with Brownhoist engineers.

BROWNHOIST builds better cranes



INDUSTRIAL BROWNHOIST CORPORATION • BAY CITY, MICHIGAN • DISTRICT OFFICES: New York, Philadelphia, Cleveland, San Francisco, Chicago; Canadian Brownhoist, Ltd., Montreal, Quebec • AGENCIES: Detroit, Birmingham, Houston, Los Angeles

Two ways hollow-part makers can save steel with TIMKEN® seamless steel tubing



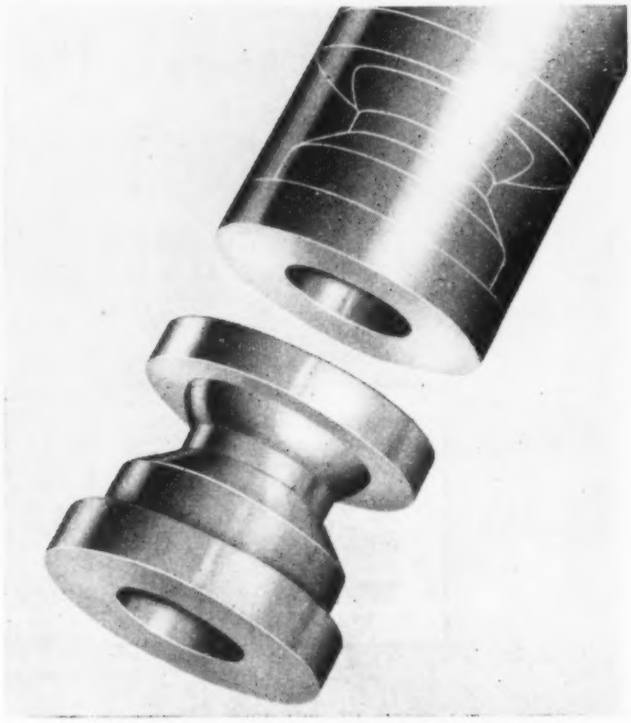
1. DRILLING ELIMINATED!

YOU save two ways when you use Timken® seamless steel tubing instead of bar stock for hollow cylindrical parts.

First, the center hole is already there! Drilling is eliminated, finish boring is often your first production step. You get more parts per ton of steel because there's less steel to machine away.

Second, the Timken Company offers you a tube engineering service which recommends the most economical tube size for your job—guaranteed to clean up to your finished dimensions.

You make your machine tools more productive by using Timken seamless tubing. Since you don't have to drill the center hole, screw machine stations can be released for other operations. You get added machine capacity without additional machines.



2. MOST ECONOMICAL SIZE!

You get a better quality product, too. The piercing operation by which Timken tubing is made is basically a forging operation. It gives the tubing a uniform spiral grain flow and a refined grain structure that brings out the best in the quality of the metal. And the Timken Company's rigid control makes sure this quality is uniform from tube to tube and heat to heat. The Timken Roller Bearing Company, Steel and Tube Division, Canton 6, Ohio. Cable address: "TIMROSCO".

YEARS AHEAD—THROUGH EXPERIENCE AND RESEARCH

TIMKEN

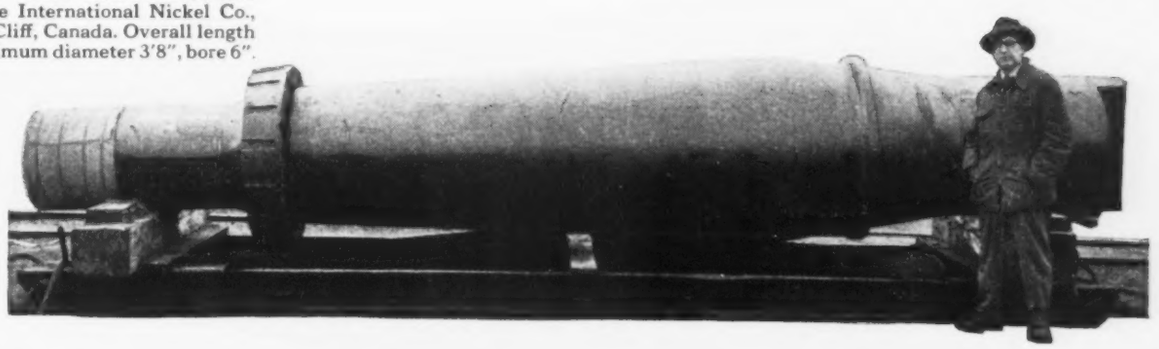
TRADE-MARK REG. U.S. PAT. OFF.

Fine Alloy

STEEL

SPECIALISTS IN FINE ALLOY STEELS, GRAPHITIC TOOL STEELS AND SEAMLESS TUBING

GIANT NICKEL STEEL SHAFT... installed as a replacement on a 54" crusher, to assure maximum service life for The International Nickel Co., at Copper Cliff, Canada. Overall length 21'6", maximum diameter 3'8", bore 6".



How Nickel Helps a Crusher

PUT THE SQUEEZE ON COSTS

Many forgings are so large that only part of the mass can be worked under the press before the steel has to be reheated. These large sections of steel, typified by this crusher shaft, so limit the cooling rate as to make liquid quenching ineffective.

Consequently, improved strength, hardness and other properties that prolong life of large forgings are much more dependent upon wise selection of alloy content than is the case with small forgings.

Because of these facts, the large crusher shaft shown above was forged from a 160,000-pound ingot of 2¾ per cent nickel steel... produced, rough-turned and heat-treated by the Bethlehem Steel Company, and finish-machined by the Traylor Engineering Company of Allentown, Pa.

After normalizing and tempering, two tests on longitudinal specimens, taken from a prolongation at mid-radius, averaged as follows:

Tensile Strength	80,000 p.s.i.
Yield Strength	51,000 p.s.i.
Elong. in 2"	28.0%
Red. of Area	58.3%

The strengthening effect of nickel on ferrite is independent of carbon content or heat treatment of the steel, and its effectiveness in reducing the rate and temperature of the upper transformation, induces better response to the necessarily milder heat treatments used.

Nickel alloy steels may help you obtain peak performance from vital parts of *your* products or equipment. Send us the details of your problems for our suggestions. Write us now.

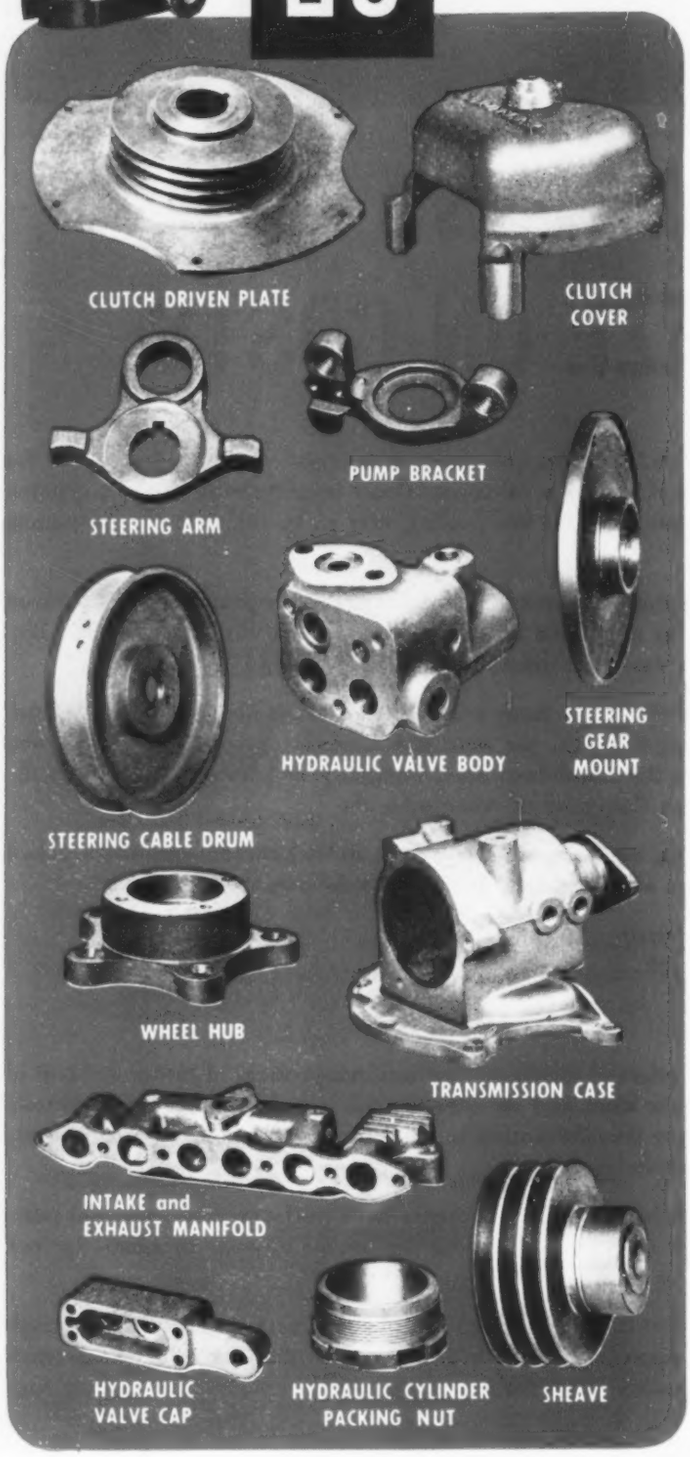
At present, most of the nickel produced is being diverted to defense. Through application to the appropriate authorities, nickel is obtainable for the production of engineering alloy steels for many end uses in defense and defense supporting industries.

EMBLEM OF INCO SERVICE

THE INTERNATIONAL NICKEL COMPANY, INC. 67 WALL STREET NEW YORK 5, N. Y.

Fig. 1

23 MEEHANITE Castings in this HiDUTY Lift Truck



TRANSITIER Truck Co., Portland, Oregon, specify 23 important cast components in their line of HiDuty Lift Trucks (Fig. 1) in Meehanite metal. The importance of these parts is further emphasized by the fact that in recent months a number of them have been redesigned from original steel and bronze specifications. In addition to the ones shown, the following parts are Meehanite castings:

1. WHEEL SPACER
2. HYDRAULIC VALVE BODIES(2)*
3. CLUTCH DRIVEN PLATE
4. CLUTCH SUPPORT
5. TRANSMISSION CASE
6. BRAKE DRUM
7. WHEEL HUB(1)*
8. HYDRAULIC CYLINDER PACKING NUT (2)*

**In addition to similar parts shown.*

The design and specification of these components is a good example of the beneficial results of team work between a foundry manufacturing high property, high quality castings, and a manufacturer alert to the possibilities of incorporating dependability into his product through proper specification. The use of Meehanite castings provides a sure knowledge that both service and production requirements will be met regularly and repeatedly.

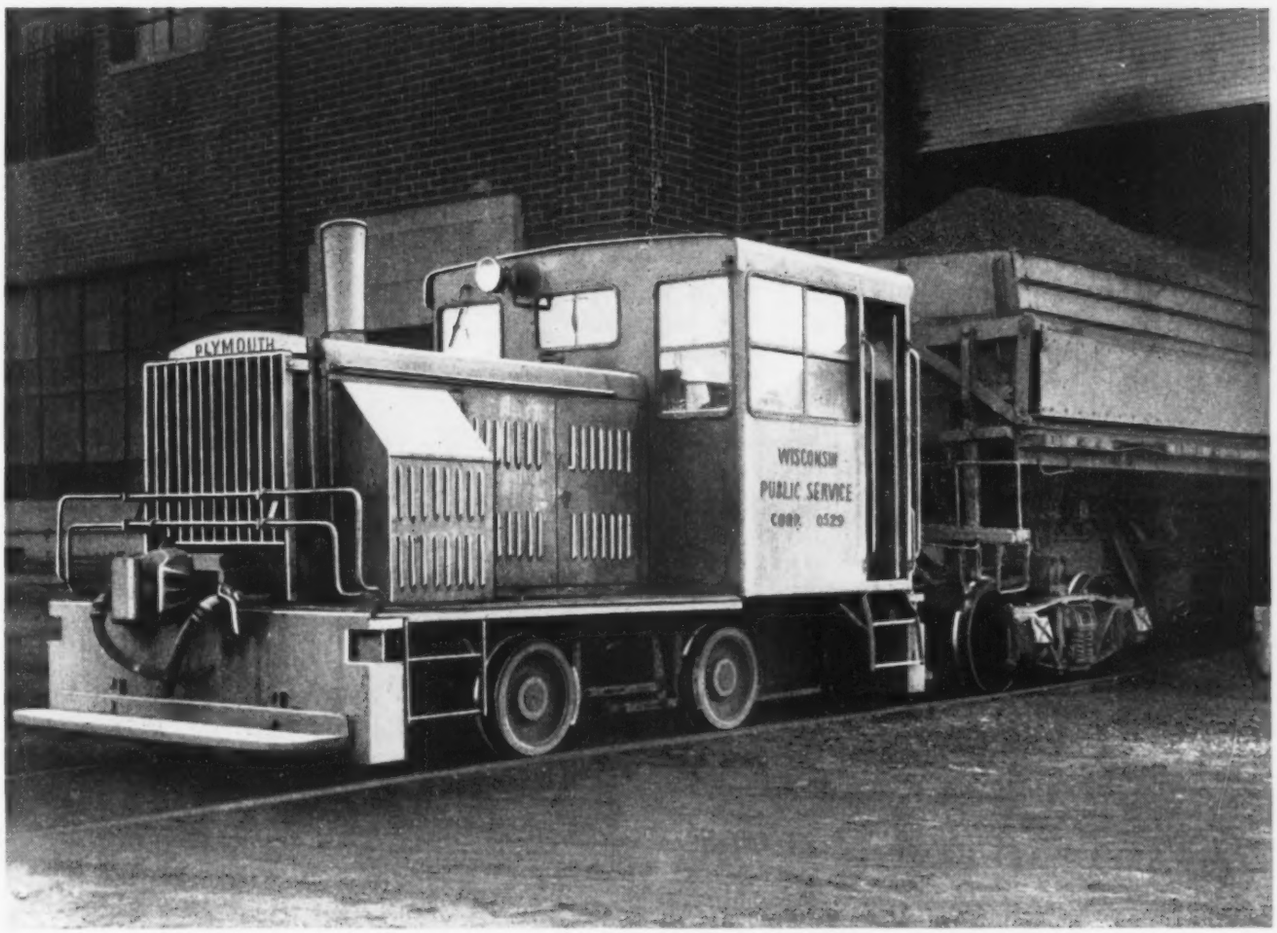
Write for our new Bulletin 35 "Meehanite Castings Serve all Industry."

Take *YOUR* Casting Problem To
A MEEHANITE FOUNDRY

American Brake Shoe Co. . . . . Mahwah, New Jersey
The American Laundry Machinery Co. . . . . Rochester, New York
Atlas Foundry Co. . . . . Detroit, Michigan
Banner Iron Works . . . . . St. Louis, Missouri
Barnett Foundry & Machine Co. . . . . Irvington, New Jersey
E. W. Bliss Co. . . . . Hastings, Mich. and Toledo, O.
Builders Iron Foundry . . . . . Providence, Rhode Island
Compton Foundry . . . . . Compton, Calif.
Continental Gin Co. . . . . Birmingham, Alabama
Crawford & Doherty Foundry Co. . . . . Portland, Oregon
The Cooper-Bessemer Corp. . . . Mt. Vernon, Ohio and Grove City, Pa.
Empire Pattern & Foundry Co. . . . . Tulsa, Oklahoma
Farrel-Birmingham Co., Inc. . . . . Ansonia, Connecticut
Florence Pipe Foundry & Machine Co. . . . . Florence, New Jersey
Fulton Foundry & Machine Co., Inc. . . . . Cleveland, Ohio
General Foundry & Manufacturing Co. . . . . Flint, Michigan
Greenlee Foundry Co. . . . . Chicago, Illinois
The Hamilton Foundry & Machine Co. . . . . Hamilton, Ohio
Hardinge Company, Inc. . . . . New York, New York
Hardinge Manufacturing Co. . . . . York, Pennsylvania
Johnstone Foundries, Inc. . . . . Grove City, Pennsylvania
Kanawha Manufacturing Co. . . . . Charleston, West Virginia
Lincoln Foundry Corp. . . . . Los Angeles, California
E. Long Ltd. . . . . Orillia, Ontario
Otis Elevator Co., Ltd. . . . . Hamilton, Ontario
The Henry Perkins Co. . . . . Bridgewater, Massachusetts
Pohlman Foundry Co., Inc. . . . . Buffalo, New York
Rosedale Foundry & Machine Co. . . . . Pittsburgh, Pennsylvania
Ross-Meehan Foundries . . . . . Chattanooga, Tennessee
Shenango-Penn Mold Co. . . . . Dover, Ohio
Sonith Industries, Inc. . . . . Indianapolis, Ind.
Standard Foundry Co. . . . . Worcester, Massachusetts
The Stearns-Roger Manufacturing Co. . . . . Denver, Colorado
Traylor Engineering & Mfg. Co. . . . . Allentown, Pennsylvania
Valley Iron Works, Inc. . . . . St. Paul, Minnesota
Warren Foundry & Pipe Corporation . . . . . Phillipsburg, New Jersey

"This advertisement sponsored by foundries listed above."

MEEHANITE® NEW ROCHELLE, N. Y.



SMOOTH OPERATION *at low cost*

Important money is saved when dependable equipment does a first rate job with no breakdowns. On hundreds of locations smooth running Plymouth Locomotives are providing such savings—hauling, switching, and spotting big loads with cost-cutting efficiency.

Typical of the many users of Plymouth Locomotives is the Pulliam Plant of the Wisconsin Public Service Company of Green Bay, Wisconsin. There a 20-ton Plymouth, on the job up to 125 hours a month, hauls coal at a cost well below that of previous methods. Particularly popular with the operators is the smooth performance obtained with Plymouth's Torque Converter.

Discover now how Plymouth Locomotives can speed your hauling and cut costs. Send for catalog describing 3 to 70 ton sizes . . . gasoline, Diesel, mechanical, or hydraulic drive, and Diesel-electric . . . narrow and standard gauge.

PLYMOUTH LOCOMOTIVE WORKS, Division of The Fate-Root-Heath Company, Dept. A-2, Plymouth, Ohio.

PLYMOUTH® LOCOMOTIVES

ALSO MANUFACTURERS OF F-R-H CERAMIC MACHINERY

An Open Letter of Thanks to V.I.P.*

PHONE 3486
P. O. Box 214

H. D. PAXSON, PRESIDENT
THEDA L. PAXSON SEC. - TREAS.

PAXSON MACHINE COMPANY

Engineers and Builders of
COLD-ROLLED STRIP-MILL EQUIPMENT
Specializing in Slitting Lines
SALEM, OHIO

Users of Paxson Equipment
Coast to Coast
U. S. A.

Dear Customers:

Thanks to you, *VERY IMPORTANT PEOPLE for giving us the users' point of view in developing Paxson Slitting Equipment.

You, the actual users, are the ones who really engineered and designed Paxson Slitting Lines.

The combined knowledge, ideas and suggestions of slitting men in plants large and small have guided us in developing custom built lines that best meet your specific needs.

For the utmost in modern efficiency and economical operations, users rely on us for both general and heavy duty lines.

Now, more than ever, it truly can be said:
"PAXSON GIVES YOU THE EDGE".

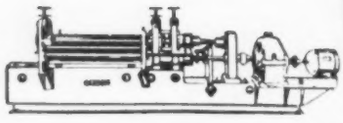
Appreciatively yours,

PAXSON MACHINE COMPANY

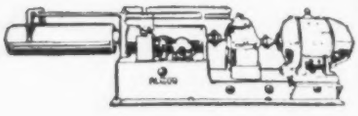
H. D. Paxson, President

HDP/t

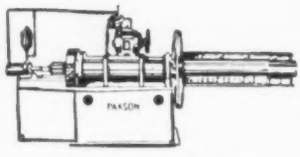
"PAXSON GIVES YOU THE EDGE"
REG. T. M.



SLITTERS



COILERS



PAY-OFF REELS

Do You Fly?

2800 ft. E.W. runway and club house, private field 2 miles west of Salem, maintained for your convenience. Wire or phone arrival time. We will meet your plane.

6

PAXSON MACHINE CO.

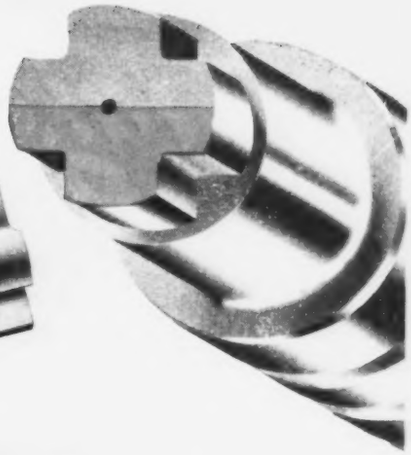
SALEM • OHIO

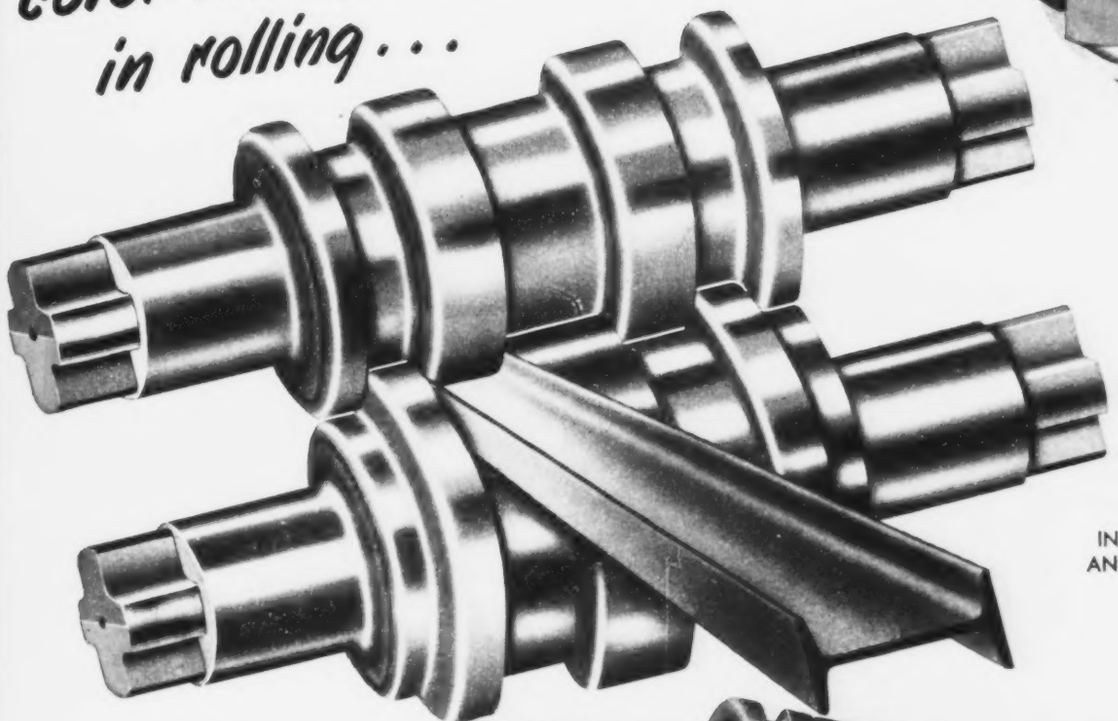
Engineers and Builders of Cold-Rolled Strip-Mill Equipment SPECIALIZING IN SLITTING LINES

REMEMBER, ALL PAXSON LINES ARE CUSTOM BUILT

CO

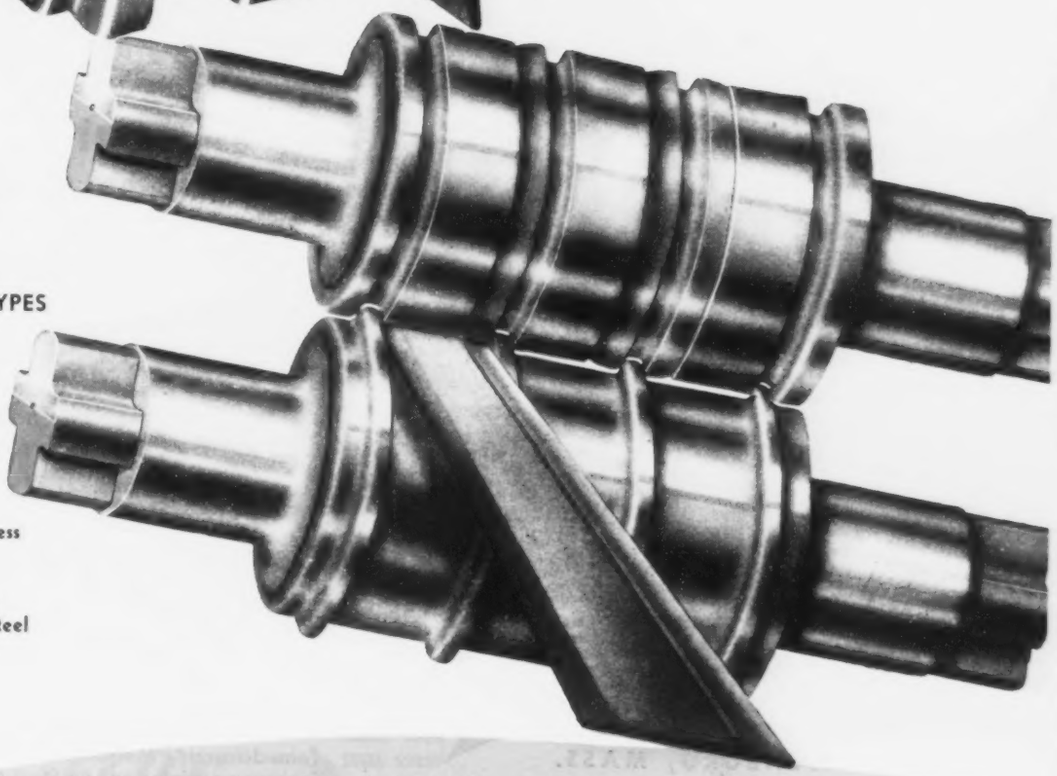
PHOENIX METAL ROLLS are color marked for specific uses in rolling . . .





BEAMS

INTERMEDIATE
AND FINISHING



TIE PLATE

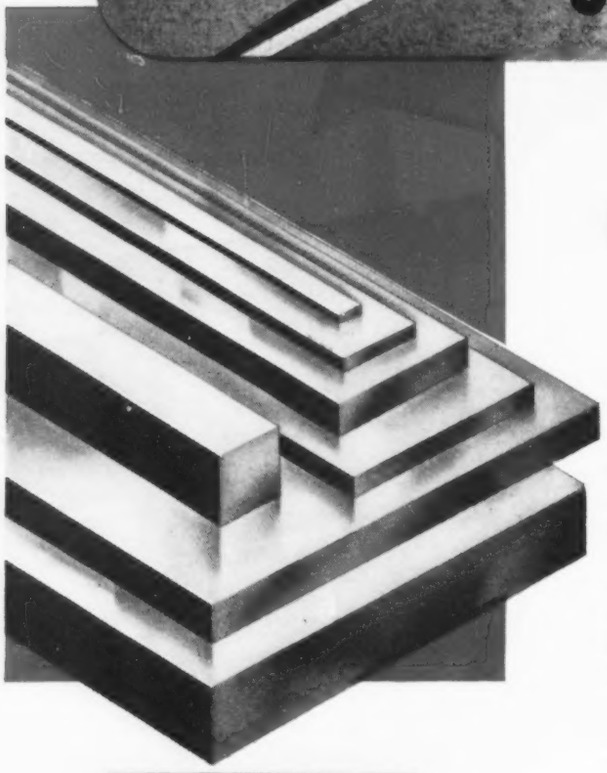
INTERMEDIATE
AND FINISHING

OTHER PITTSBURGH ROLL TYPES

Chill
Moly Chill
Special Rail Finishing
Phoenix "K"
Pittsburgh Grade 25
Pittsburgh Grade 35
Pittsburgh Grade 45
Pittsburgh Grade 55
Pittsburgh Grade Special Process
Phoenixloy
Phoenix Metal Master
Phoenix "A" Alloy Steel
Phoenix "A" Special Alloy Steel
Carbon Steel

PITTSBURGH ROLLS

PITTSBURGH ROLLS DIVISION of BLAW-KNOX COMPANY • PITTSBURGH, PA.



SIMONDS

Now Makes Both Types of Flat Ground DIE STEEL

Simonds offers you a choice of OIL or AIR Hardening DIE STEEL, whichever is best suited to your requirements. Both types are made from Simonds own steel, are precision ground to a thickness limit of plus or minus .001" and have an extra smooth surface finish of 25 to 35 micro inches. Edges and ends are square and parallel, with all scale, decarburation and surface defects removed. All sizes come individually packaged with heat treating instructions.

SIMONDS AIR HARDENING DIE STEEL

(non-deforming 5% Chrome Type) is spherodize annealed for good machinability and uniform hardenability. Its wide hardening range (1700° to 1800° F.) makes it practically foolproof in heat-treating. Stock sizes run from ½" to 2" thick and 2" to 10" wide in 36" lengths.

SIMONDS OIL HARDENING DIE STEEL

(non-deforming Molybdenum Type) is uniformly annealed for easy machining and uniform hardening. Due to its wide hardening range (1450° to 1540°) good results are assured with even the simplest heat treating equipment. Stock sizes are available from 1/64" to 3" thick and ⅛" to 14" wide in 18" lengths. The heavier sizes also come in 36" lengths.

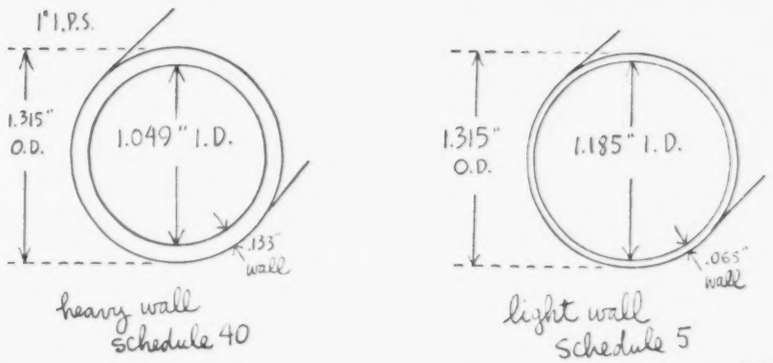
Try a bar on your next job. Your Simonds Distributor carries many sizes of both types in stock — call him right now.

SIMONDS SAW AND STEEL CO.

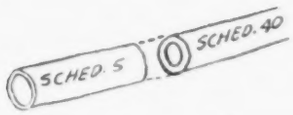
FITCHBURG, MASS.

Factory Branches in Boston, Chicago, San Francisco and Portland, Oregon.
Canadian Factory in Montreal, Que.
Southern Service Shop in Meridian, Miss. (formerly J. H. Miner Saw Mfg. Co.).
Simonds Divisions: Simonds Steel Mill, Lockport, N. Y.,
Simonds Abrasive Co., Phila., Pa. and Arvida, Que., Canada

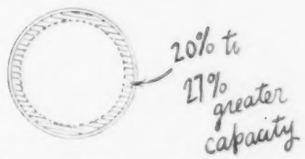
here's what you gain with stainless schedule 5 pipe



You save money. Schedule 5 pipe costs about half as much per foot as Schedule 40.



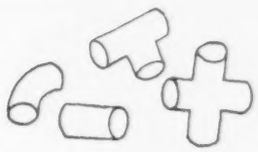
Schedule 5 has the same O.D. as Schedules 10, 40 and 80 —for hook-up with existing lines as well as for new installations.



Its larger I.D. increases flow and capacity in pipelines, exchangers and other equipment.

It's lighter. This means quicker and easier installation.

You can save substantially on valves, fittings, weld rods, etc., because smaller O.D. material can frequently be used. Tubing sizes can now be replaced with light wall pipe . . . for ready hook-up with standard valves, pumps, and other equipment normally manufactured in pipe sizes.



Fittings as well as stocks of Schedule 5 pipe are carried by conveniently located Carpenter distributors.

Specify Schedule 5 pipe . . . it saves dollars . . . and makes a lot of sense!

THE CARPENTER STEEL COMPANY
Alloy Tube Division, Union, N. J.
Export Dept : The Carpenter Steel Co., Port Washington, N.Y. "CARSTEELCO"

Data Sheets give you complete information about Carpenter Schedule 5 Stainless Pipe. Write for your personal copy.

THE U.S. NEEDS YOUR STEEL SCRAP NOW

more than corrosion resistance

Carpenter

STAINLESS TUBING & PIPE

- guaranteed on every shipment

A Program for 30 million new Americans

LISTEN to the voices of 30 million new Americans. They are answering the pessimists who say we are threatened with depression because we can't keep our farms and factories busy.

Let these pessimists read the future in the census returns. There is a tremendous upsurge in our population. Last year nearly 4 million babies were born. By 1960 we shall total 170 million people--30 million more than when war ended in 1945. This adds to our domestic market more people than there are in Canada and Australia combined.

Providing for these 30 million new Americans can keep our production machinery going at capacity. They call for new hospitals, schools and churches. Larger families need bigger houses to replace postwar houses that are too small now. More and bigger families need improved home equipment and more new automobiles. In short, to maintain and improve living standards for our children, we must work harder than ever before. To supply the needs of our 1960 population, including adequate national defense, it is estimated that the productivity of the individual worker must increase at least 30%, with additional investment of over 200 billion dollars in capital facilities.

There should be no room in this picture for depression. But we must have economy in government, elimination of waste and extravagance and a reduction of taxes and public debt. If we encourage private incentive, thrift and investment, we can bring about the greatest advance in health, wealth and happiness that America has ever known.

QUALITY V YOUNGSTOWN SERVICE

The Youngstown Sheet and Tube Company

General Offices--Youngstown 1, Ohio
Export Offices--500 Fifth Avenue, New York

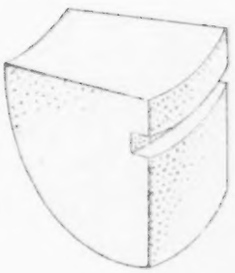
MANUFACTURERS OF CARBON ALLOY AND YOLOY STEELS

RAILROAD TRACK SPIKES - CONDUIT - HOT AND COLD FINISHED CARBON AND ALLOY BARS - PIPE AND TUBULAR PRODUCTS - WIRE - ELECTROLYTIC TIN PLATE - COKE TIN PLATE - RODS - SHEETS - PLATES.

B&W KAOCAST goes in more furnaces because...

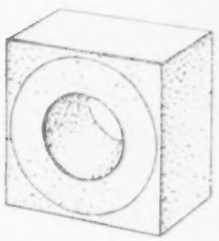
Versatile B&W Kaocast can be molded quickly and easily with your own labor. It can also be cast directly in place or applied with a cement gun. This unique 3000 degree refractory castable has high resistance to spalling and slag attack, low volume change and negligible reheat shrinkage. Consult a B&W Refractories Engineer on your specific applications and see how B&W Kaocast can save money for you.

It cuts inventory



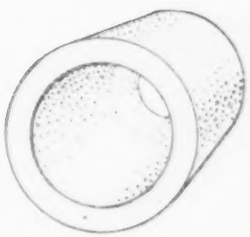
Nose arches for oil heaters were formerly made with special shapes of ordinary firebrick. Switching to quickly moldable Kaocast eliminated need for expensive special-shape inventory . . . minimized delays. In addition, side by side tests proved that Kaocast far outlasted the ordinary firebrick.

It speeds repairs



Kaocast was specified for the charging front of a forging furnace, used to heat heavy pipe ends. The reason? Kaocast linings were molded faster . . . give longer service, could be made when convenient and stored 'til needed.

It lasts longer



A chemical plant found that burner tile for a heating furnace made of an ordinary castable stood up only 3 to 4 months. But Kaocast burner tile stayed on the job 16 months and longer. Thousands of pounds of Kaocast have been used for this and many other applications in this plant.

BABCOCK & WILCOX

THE BABCOCK & WILCOX CO.
REFRACTORIES DIVISION
GENERAL OFFICES: 161 EAST 42nd ST., NEW YORK 17, N.Y.
WORKS: AUGUSTA, GA.

R455

B&W REFRACTORIES PRODUCTS — B&W Allmul Firebrick • B&W 80 Firebrick • B&W Junior Firebrick • B&W Insulating Firebrick B&W Refractory Castables, Plastics and Mortars • OTHER B&W PRODUCTS—Stationary & Marine Boilers and Component Equipment... Chemical Recovery Units . . . Seamless & Welded Tubes . . . Pulverizers . . . Fuel Burning Equipment . . . Pressure Vessels . . . Alloy Castings

Here at Sterling Bolt Co., a single, integrated DEPENDABLE source can supply you with more than **200,000** stock and standard sizes in Bolts, Nuts, Screws and Washers for your specific needs.

For more than 35 years Sterling Bolt has been a prime supplier of metal fastenings to America's best-known companies—because Sterling facilities combine both warehouse and mill, giving you advantages of **PROMPT SERVICE** and **COMPETITIVE DISCOUNTS.**

try these for SIZE

THE INDUSTRIES WE SERVE— AND SERVE WELL!

Refrigeration • Pumps • Cranes • Elevators • Tractors • Trailers • Conveyors • Mining Equipment • Blower & Fan Equipment • Diesel Engines • Bodies—Motor Truck & Trailer • Electrical Manufacturing • Air Conditioning • Material Handling Equipment • Machinery Manufacturing • Radio & Television • and many others—

Interested in Cutting Costs?

No need to count on expensive, time-consuming specials when Sterling Bolt Standardized Bolts, Nuts and Screws can fit your job—200,000 to one!

Send your inquiry or order TODAY—to the

STERLING BOLT CO.

403 West Erie Street, Chicago 10, Ill.

Telephone: SUperior 7-3000 • Teletype:CG 488

Offices: Cincinnati, Indianapolis, Milwaukee, St. Louis

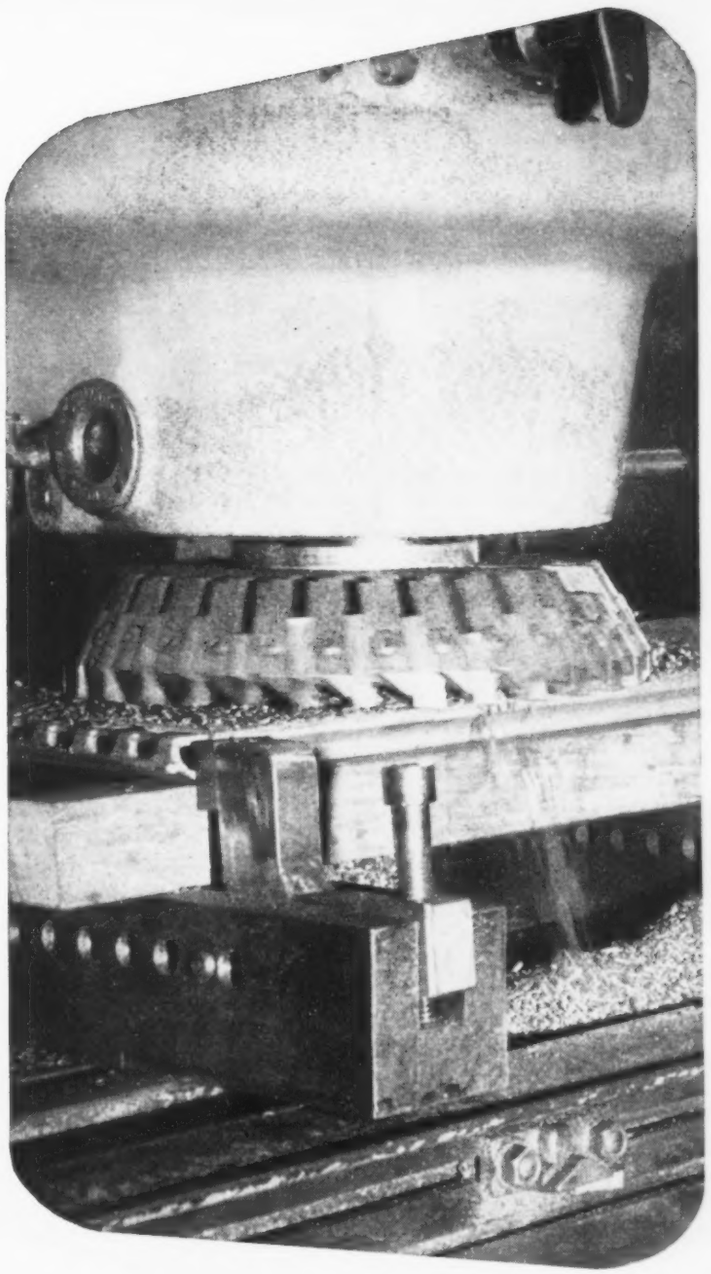
Manufacturing plants in Chicago, Milwaukee, St. Louis

A WEEK'S FINISHING DONE IN A DAY

HAYNES STELLITE alloy milling cutter blades recently solved a tough finishing problem in the production of cast iron mold jackets. Face-milling operations with harder tool materials failed because of chipping and spalling of the cutter blades after finishing only a few castings. Then the foundry tried grinding the jackets. But this was too slow; it took at least 30 minutes to grind each one.

A switch to HAYNES STELLITE Star J-Metal blades cut finishing time to a mere six minutes per casting. An extra saving results from the long life of the HAYNES STELLITE alloy blades. They produce about 350 pieces per grind.

HAYNES STELLITE alloy tools are ideal for cast iron milling jobs because of their high compressive strength at cutting temperatures, good impact strength, and extremely low coefficient of friction. Contact our nearest District Office for on-the-job help with your machining problems, or write for the new manual, "HAYNES STELLITE Metal-Cutting Tools."



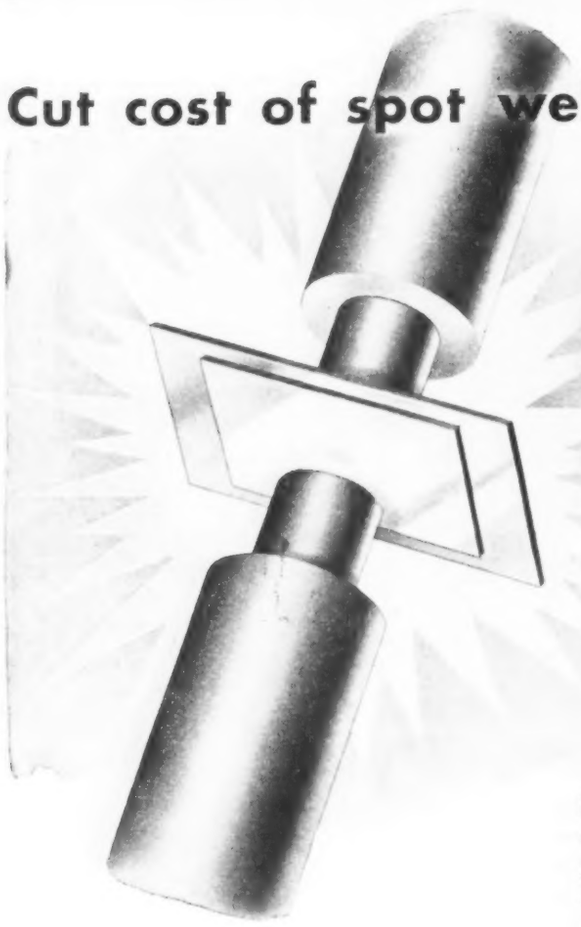
This 12-in. diameter cutter, containing 32 HAYNES STELLITE alloy inserted blades, removes 1/16-in. of stock from cast iron mold jackets. A 36-in. casting is milled with this setup in about 1/5 the time required for grinding.

HAYNES TRADE-MARK *alloys*

Haynes Stellite Company
A Division of
Union Carbide and Carbon Corporation
UCC
General Offices and Works, Kokomo, Indiana
Sales Offices
Chicago — Cleveland — Detroit — Houston
Los Angeles — New York — San Francisco — Tulsa

"Haynes" and "Haynes Stellite" are trade-marks of Union Carbide and Carbon Corporation.

Cut cost of spot welding stainless steel . . . with MALLORY 100 METAL FLUTED ELECTRODES*



If you're spot welding stainless or other high strength steels—or any alloys having relatively high electrical resistance—you'll get more welds per dollar with fluted electrodes of Mallory 100 alloy. Outstanding features of these electrodes are:

1. **Fluted water cooling hole:** Provides 70% more heat transfer area for cooling water. An exclusive Mallory design now produced in Mallory 100 metal electrodes through new manufacturing techniques.
2. **High hardness and strength:** The higher hardness and strength of Mallory 100 metals coupled with excellent abrasion resistance and high annealing temperature, provide the ideal electrode for spot welding stainless steel, Inconel and other high-strength, heat-resisting alloys.
3. **Maximum electrode life:** Mallory 100 fluted electrodes produce the maximum number of welds of good strength, quality and consistency per dressing. By reason of the high strength and hardness of the electrode material and the most efficient design for cooling, the deformation of the welding face is held to a minimum.

Fluted electrodes of Mallory 100 are available in all standard shapes, and can be supplied in special forms to meet your individual requirements. For full details, call Mallory today, or contact your local distributor.

Behind every MALLORY Product . . .

. . . stand more than 25 years of metallurgical development and application experience in all types of resistance welding. This wealth of engineering knowledge is at your service, ready to work on your welding problems.

For low-cost, high-production welding, look to Mallory for electrodes, holders, dies, castings, forgings, rods and bars.

*Trade Mark, Patent Pending

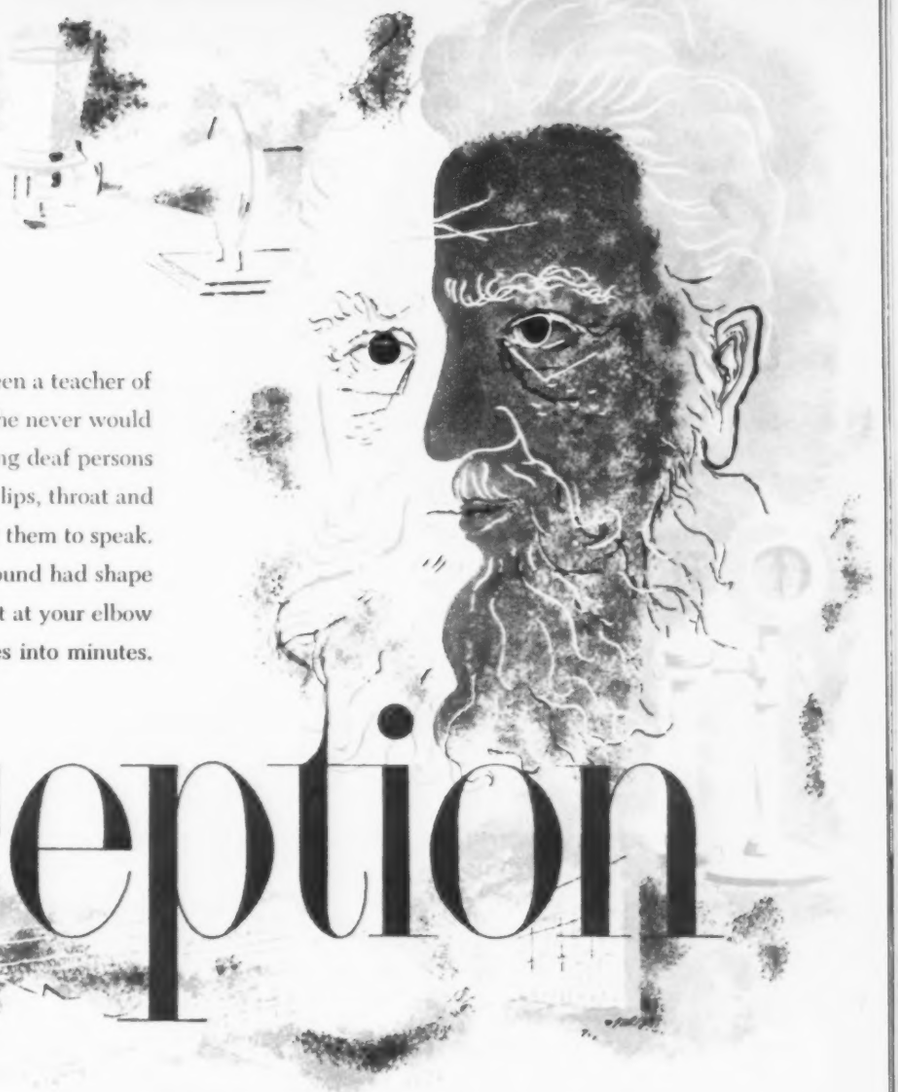
In Canada, made and sold by Johnson Matthey and Mallory, Ltd., 110 Industry St., Toronto 15, Ontario.

P. R. MALLORY & CO. Inc.
MALLORY

SERVING INDUSTRY WITH THESE PRODUCTS:
Electromechanical—Resistors • Switches • Television Tuners • Vibrators
Electrochemical—Capacitors • Rectifiers • Mercury Dry Batteries
Metallurgical—Contacts • Special Metals and Ceramics • Welding Materials

P. R. MALLORY & CO., INC., INDIANAPOLIS 6, INDIANA

For information on titanium developments, contact Mallory-Sharon Titanium Corp., Niles, Ohio



If Alexander Graham Bell hadn't been a teacher of "visible speech" it is probable he never would have invented the telephone ★ By showing deaf persons the positions held by the mouth, lips, throat and tongue to make sounds, Bell taught them to speak. His uncanny perception—that sound had shape—led to the indispensable instrument at your elbow that transforms miles into minutes.

perception

Many of the men responsible for making a new or improved product better, faster and cheaper are finding the answers to their problems with Van Huffel cold formed metal shapes and tubing ★ So, don't shelve that seemingly impossible idea because of the known limitations of methods and materials.

It's just possible Van Huffel's half century of experience and perception of shapes for things to come can transform that mental image into a metal miracle.

Van Huffel

TUBE CORPORATION · WARREN, OHIO

WELDED · LOCK SEAM · OPEN SEAM · BUTTED TUBING · METAL SHAPES · MOULDINGS

South Bend

2-H PRECISION TURRET LATHE

This precision-built turret lathe is designed specifically for the rapid machining of accurate duplicate parts. It is especially suited for second operations that require close tolerances, smooth finishes and high productivity.

The exceptionally wide ranges of power cross feeds, power longitudinal feeds, thread cutting feeds and power turret feeds provide combinations that permit maximum cutting speeds through the entire machining cycle. Machine handling is fast and easy as excessive mass is not present in carriage and ram assemblies. Write for Catalog 67-F for complete information.

2-H TURRET LATHE SPECIFICATIONS

MAXIMUM COLLET CAPACITY . . . . 1"
With handlever collet chuck.

SPINDLE BORE . . . . . 1⅜"

SPINDLE SPEEDS—Twelve with 2-speed motor . . . . . 20 to 945 r.p.m.

SWING—over bed . . . . . 16¼"
over cross slide . . . . . 6⅞"

CROSS SLIDE FEEDS—48 in or out . . . . . .0006" to .0315"

CROSS SLIDE TRAVEL . . . . . 9¾"

CARRIAGE LONGITUDINAL TRAVEL—
6' bed . . . . . 22½"
7' bed . . . . . 34½"

CARRIAGE LONGITUDINAL FEEDS—48 R.H. or L.H. . . .0015" to .0841"

THREAD CUTTING FEEDS—48 R.H. or L.H. . . . . 4 to 224 per inch

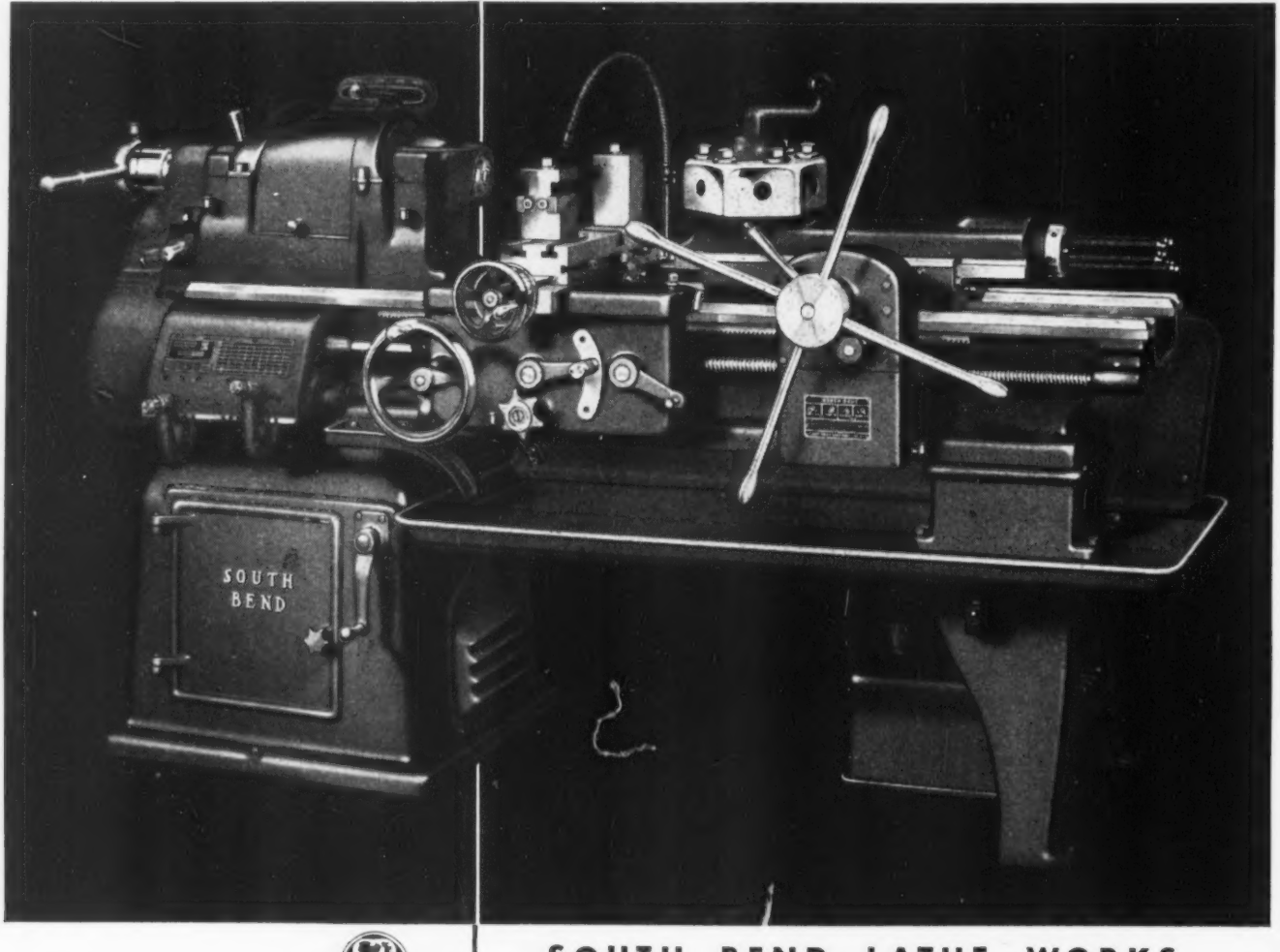
TURRET TO SPINDLE DISTANCES—Maximum with 6' bed . . . . . 28¼"
with 7' bed . . . . . 40¼"

TURRET TOOL FEED . . . . . 6⅛"

TURRET POWER FEEDS—96 reversible . . . . . .0001" to .0148"

TURRET DIAMETER . . . . . 9⅜"
between flats.

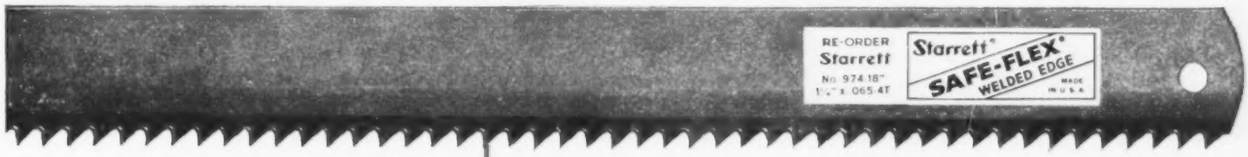
TURRET TOOL HOLES . . . . dia. 1½"
center to top of slides. . . . . 2½"



SOUTH BEND LATHE WORKS
BUILDING BETTER TOOLS SINCE 1906
425 EAST MADISON STREET, SOUTH BEND 22, INDIANA

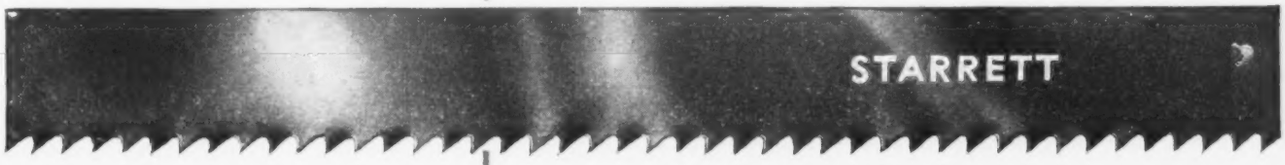
CUT

Choose the right blade for any job from the complete line of STARRETT *S-M Molybdenum M-2 High Speed Steel* hand and power blades, *High Speed Steel* (18-4-1) hand and power blades, "*Safe-Flex*" *High Speed Welded-Edge* power blades, "*Safe-Flex*" hand blades and *Starrett Standard* all hard, flexible back and "*Semi-Flex*" hand blades.



SAW

STARRETT *hard-edge, flexible back* metal cutting band saws for precision sawing, jig and contour cutting and friction sawing; *spring temper* band saws for cutting metal, wood and plastics; *Starrett "Skip-Tooth"* for cutting magnesium, aluminum, bronze, soft brass and other non-ferrous metals; also composition, fibre, bakelite, plastics and wood; and *Starrett* wood cutting band saws ... in coils in new handy reel dispenser or cut to length and welded.



SLICE

Starrett FAST-KUT Band Knives are unsurpassed for stack cutting, trimming, slicing or cut-apart operations involving soft or fibrous materials. Cut clean and fast without waste, chips, dust or ragged edges. Available in a complete range of sizes in straight-edge, scallop-edge or wavy-edge types — single or double bevel.

FASTER, BETTER WITH

Starrett

HACKSAWS
BAND SAWS
BAND KNIVES

VALUABLE INFORMATION
Starrett Hacksaw and Band Saw Catalog gives cost, performance and application data for the complete line of hacksaws, band saws and band knives.
Starrett Quick-Reference Metal Cutting Guide instantly gives complete information for cutting any metal by hacksaw or band saw.
Starrett FAST-KUT Band Knife Folder describes the complete line of band knives for high speed, low cost, precision cutting of soft or fibrous materials.

STARRETT TOOLS

Starrett

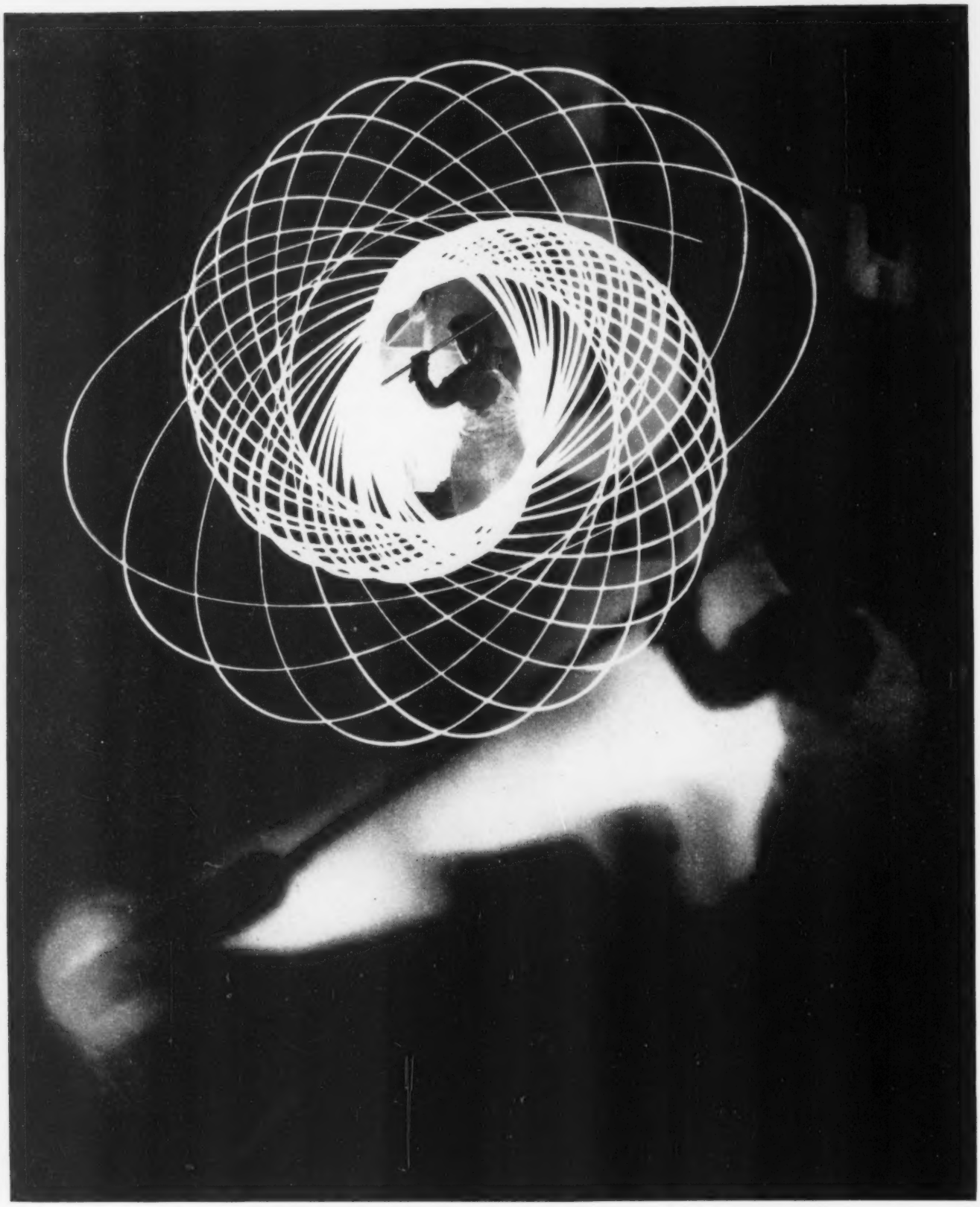
REG. U.S. PAT. OFF.

SINCE 1880
WORLD'S GREATEST TOOLMAKERS

THE L. S. STARRETT COMPANY · ATHOL, MASS., U.S.A.

BUY THROUGH YOUR DISTRIBUTOR

MECHANICS' HAND MEASURING TOOLS AND PRECISION INSTRUMENTS
DIAL INDICATORS · STEEL TAPES · PRECISION GROUND FLAT STOCK
HACKSAWS, BAND SAWS and BAND KNIVES



TITANIUM ALLOYS, produced by TAM, are used successfully as deoxidizers and stabilizers and as a source of titanium in steels and alloys. The experience gained in their development and use is available to you through our field staff and laboratory. It's yours by simply writing our New York City office.

*TAM and ZIRCONITE are registered trademarks.

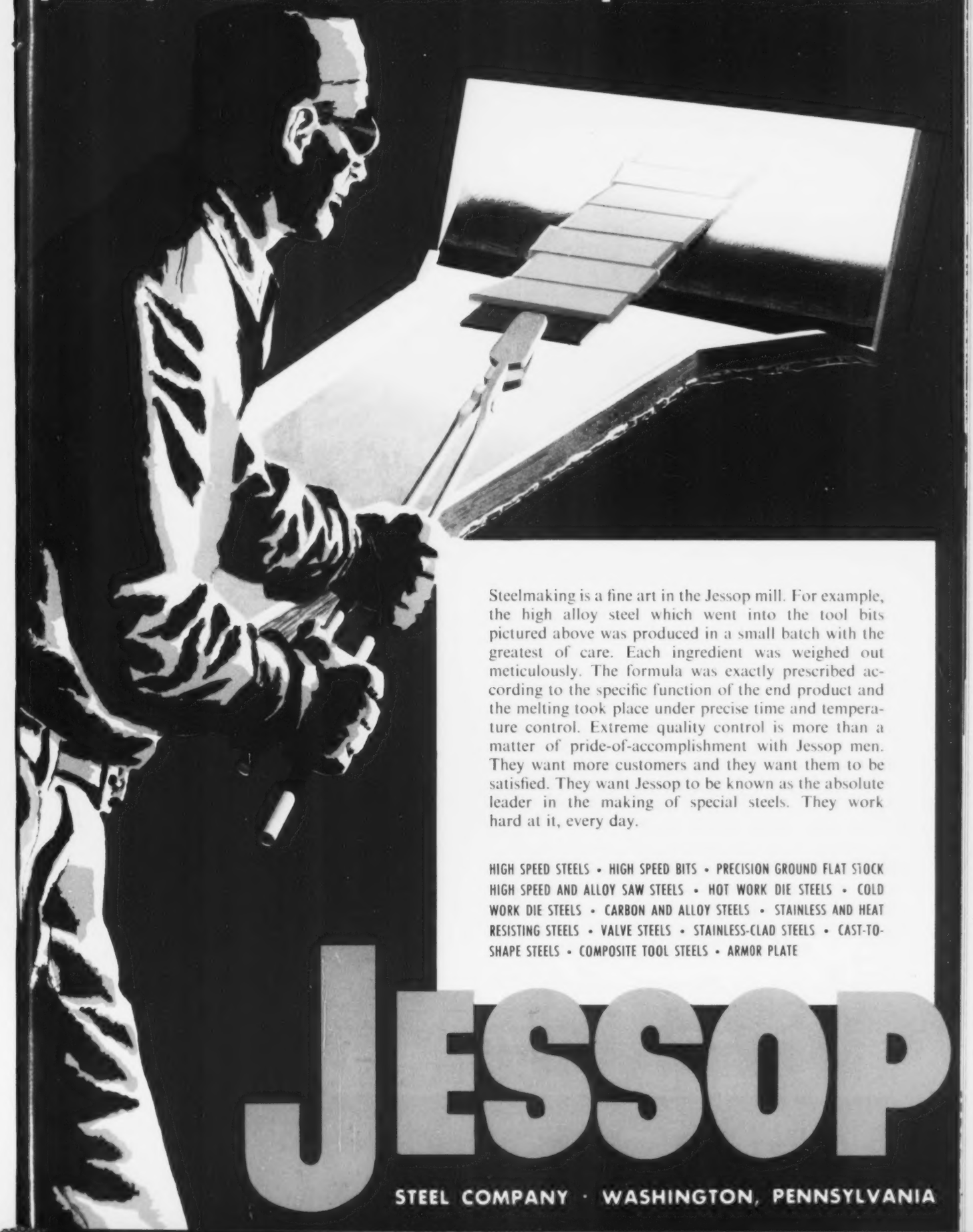
TAM
PRODUCTS
Registered U. S. Pat. Off.

TITANIUM ALLOY MFG. DIVISION
NATIONAL LEAD COMPANY

Executive and Sales Offices: 111 BROADWAY, NEW YORK CITY

General Offices, Works and Research Laboratories: NIAGARA FALLS, N. Y.

quality steel is more than pride at JESSOP

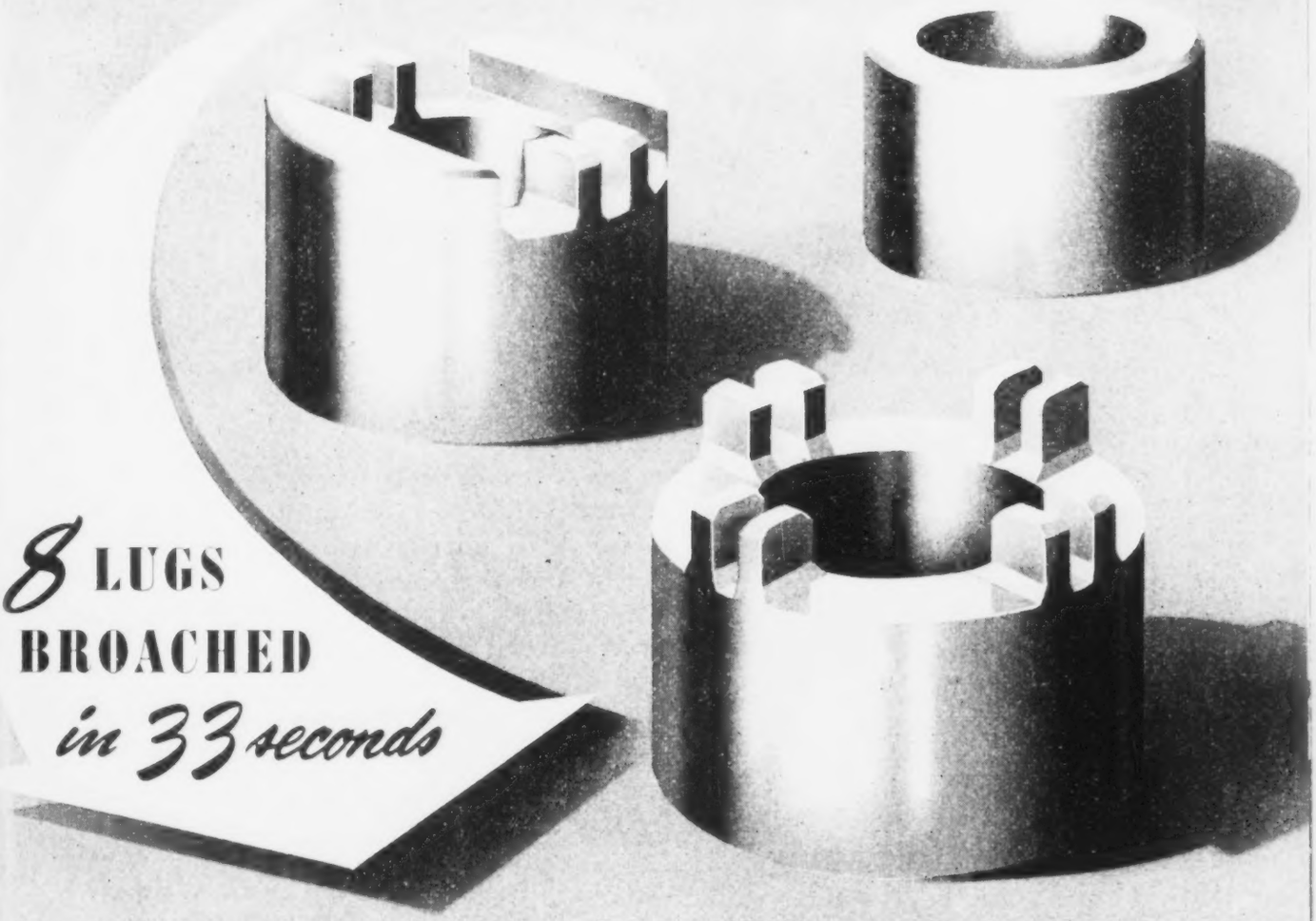


Steelmaking is a fine art in the Jessop mill. For example, the high alloy steel which went into the tool bits pictured above was produced in a small batch with the greatest of care. Each ingredient was weighed out meticulously. The formula was exactly prescribed according to the specific function of the end product and the melting took place under precise time and temperature control. Extreme quality control is more than a matter of pride-of-accomplishment with Jessop men. They want more customers and they want them to be satisfied. They want Jessop to be known as the absolute leader in the making of special steels. They work hard at it, every day.

HIGH SPEED STEELS • HIGH SPEED BITS • PRECISION GROUND FLAT STOCK HIGH SPEED AND ALLOY SAW STEELS • HOT WORK DIE STEELS • COLD WORK DIE STEELS • CARBON AND ALLOY STEELS • STAINLESS AND HEAT RESISTING STEELS • VALVE STEELS • STAINLESS-CLAD STEELS • CAST-TO-SHAPE STEELS • COMPOSITE TOOL STEELS • ARMOR PLATE

JESSOP

STEEL COMPANY · WASHINGTON, PENNSYLVANIA



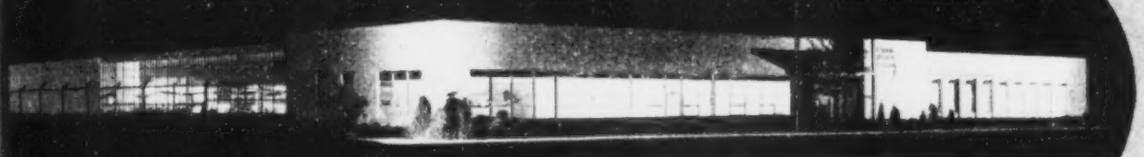
To produce eight single lugs on the end of a steel sleeve was a problem recently given to Detroit Broach.

After analysis of the operation, Detroit Broach recommended a single ram vertical surface broach to do the job. One of the problems within the job, in addition to increasing output, was the necessity of holding a close tolerance between the lugs.

The vertical broaching machine was set up with a two-station fixture which power-clamps the parts. A single pass of the broach forms four lugs across the sleeve. The sleeve is then indexed 90° and the other four lugs are formed. Complete cycle time—33 seconds per completed part. Slot tolerances are easily held and surface finish on the lugs requires no additional machining.

This is just typical of the specialized broaching techniques evolved by Detroit Broach for leading manufacturers. You, too, may have an application that can be materially reduced in time or cost by the economy of broaching or by review of present broach tooling. It will pay you to consult Detroit Broach for engineering or production data.

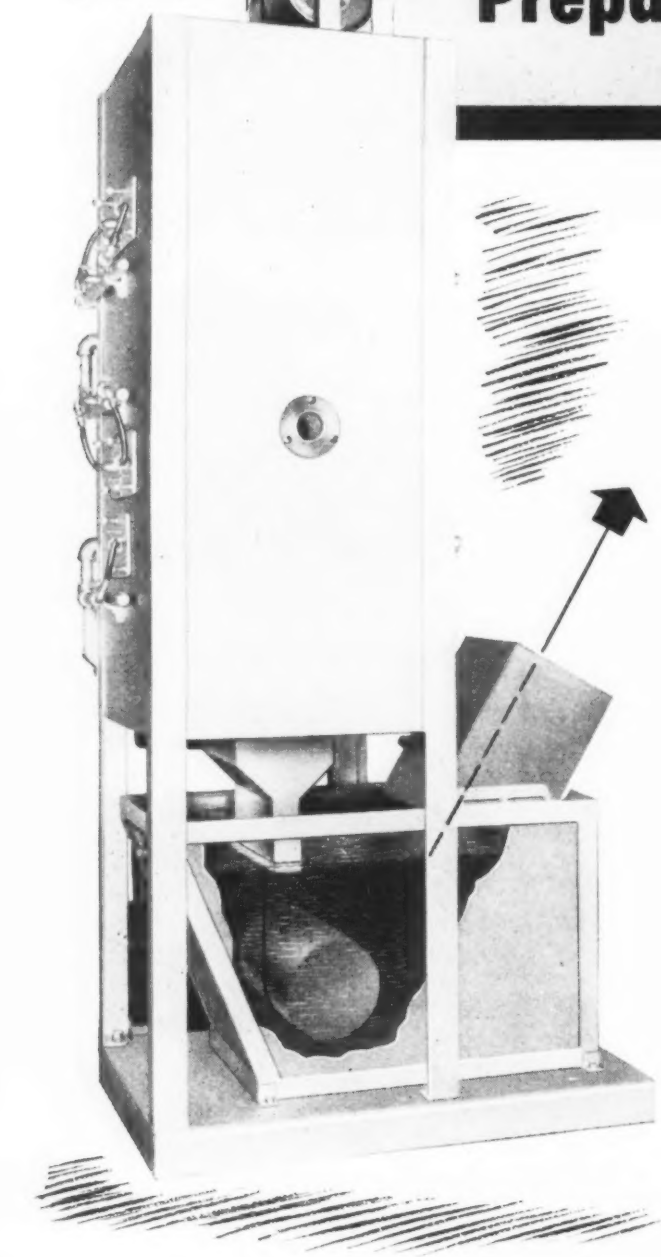
WORLD'S LARGEST MANUFACTURER OF BROACHES AND BROACHING TOOLS EXCLUSIVELY



DETROIT BROACH COMPANY

20201 SHERWOOD AVE. • DETROIT 34, MICH.

Wire Bright Annealed Without Prepared Atmosphere



Controlled combustion of fuel in the Selas gas-fired Gradiation furnace produces bright annealed copper wire.

No prepared atmosphere is necessary . . . resulting in a saving in the installation cost of inert gas generating equipment and, equally important, a saving in working area. Accurate control of the gas-air mixture produces a non-oxidizing fuel.

Furnaces are direct fired . . . no muffle, no forced circulation of gases. A copper wire annealing furnace, as shown, has a built-in quenching tank, with provision for coiling the wire immediately after quenching.

Burners are of special ceramic material, compounded to give extremely long life at the designed operating temperature. Typical of the burner durability is the case of one manufacturer who has not replaced a burner during thirteen years of furnace operation.

Furnaces of similar or other designs can be built for heating other alloys. Ask for further details from the factory or your Selas representative.

SELAS CORPORATION OF AMERICA

PHILADELPHIA 34, PENNSYLVANIA

Heat Processing Engineers for Industry — Development • Design • Manufacture

Morse ...leading producer of precision-built chain drives

MORSE SILENT CHAIN DRIVES

Industrial type: Morse Industrial Silent Chain Drives are quiet, smooth-running, reliable. They give long years of efficient service with fewer service interruptions.

Automotive type: Morse Automotive Silent Chain Drives are precision-made, mass-produced. The experience and production facilities necessary to supply thousands of these drives daily enable Morse to supply highest-quality, economical industrial drives.

MORSE STANDARD ROLLER CHAIN DRIVES

Morse Standard Roller Chain Drives are 99% efficient. They use teeth, not tension; won't slip.

Morse Standard Roller Chains are available from distributors' stock from ¼" pitch to 2½" pitch, with horsepower capacities ranging from less than 1/10 H.P. to extremely heavy horsepower applications using large-pitch, multiple-strand chains. Corresponding sprockets available in types A, B, and C.

MORSE HY-VO DRIVES

Sensational, proved Morse Hy-Vo Drives transmit more horsepower at higher speeds and lower cost than any other standard power transmission drives. They cut operating costs per hour up to 50%, operate 45% more quietly, give up to one-third longer service life. Morse Hy-Vo opens the way to transmitting far more horsepower from smaller, faster engines —without costly outboard bearings and mounts.

Morse Standard Roller Chain Drive

Morse Hy-Vo Drive in operation. Note smooth, belt-like flow.

Morse Double Pitch Roller Chain

MORSE DOUBLE-PITCH ROLLER CHAINS

Morse Double-Pitch Roller Chains give positive drive. They cost less, weigh less, and give long life comparable to that of standard roller chains. Single and double-duty sprockets available.

MORSE CABLE CHAINS

Precision-built for heavy-duty service. Standard pitches from ½" to 1", with average ultimate breaking strength of from 3900 pounds to 49,000 pounds.

For information on any of these precision-built power transmission chains or chain drives, write Morse direct or phone your Morse distributor.

Morse Cable Chain

MORSE CHAIN COMPANY
Dept. 398, 7601 Central Ave. • Detroit 10, Michigan

M=PT BASIC FORMULA

Morse *means* Power Transmission

MORSE
MECHANICAL POWER TRANSMISSION PRODUCTS
PRODUCTS OF BW

The one best way to take radial loads

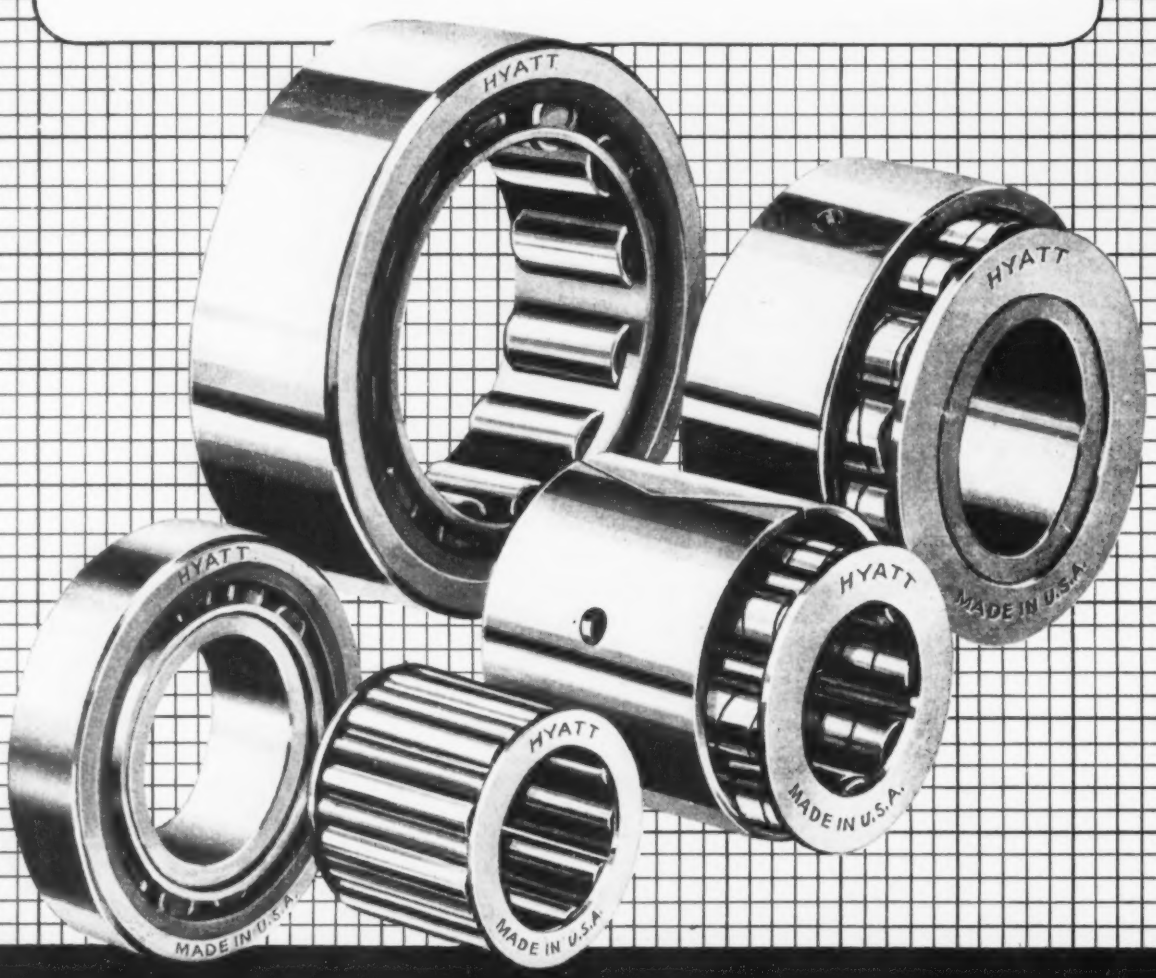
The simplest and most direct way to provide for radial bearing loads is to design with radial bearings.

In a straight cylindrical radial bearing, no radial load-carrying capacity is sacrificed to provide for other conditions. As a result, when you design in radial bearings, you achieve the greatest possible radial load-carrying capacity within given boundary dimensions. More practical design, longer bearing life and simplified assembly procedures usually result.

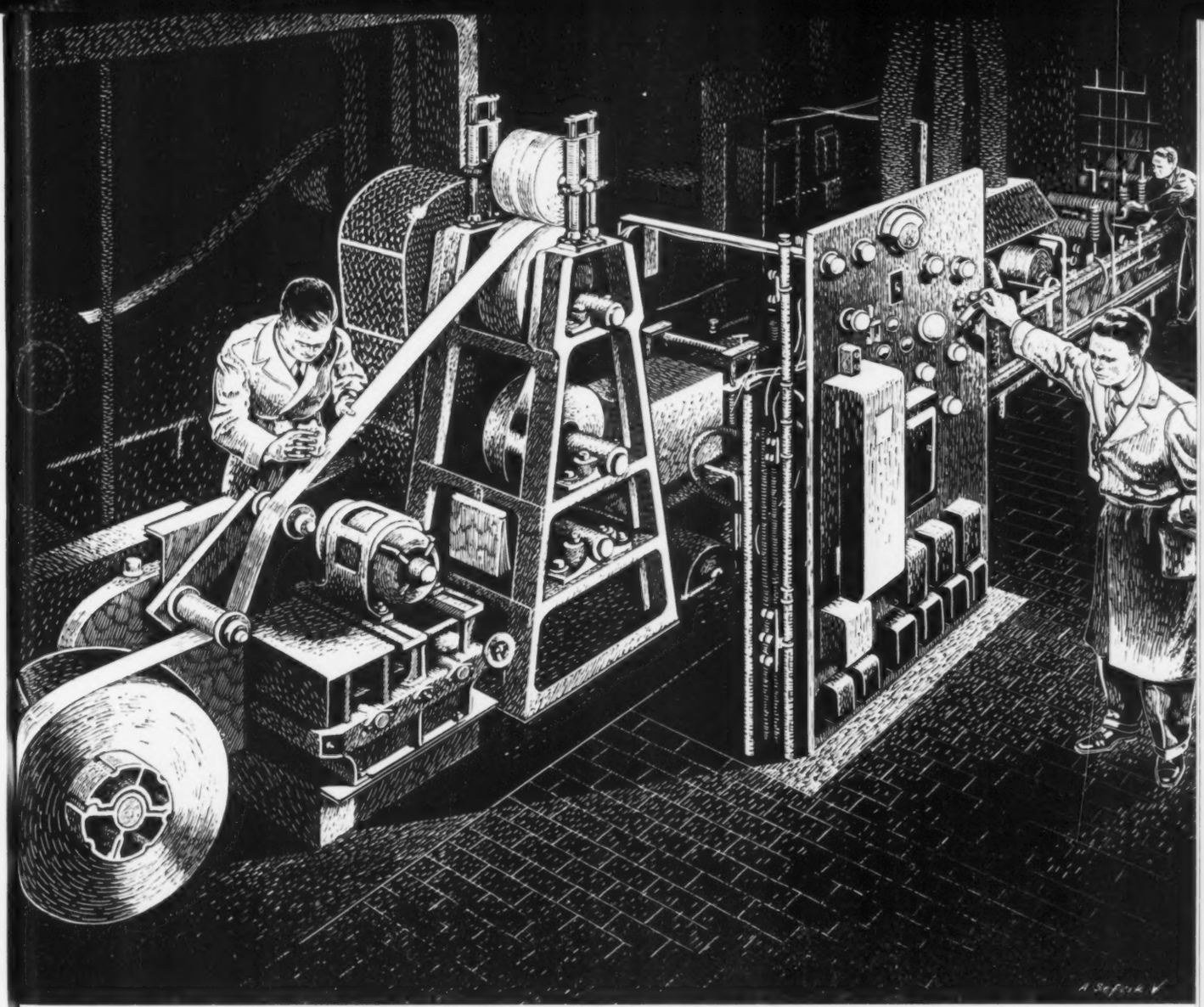
If the application involves radial loads, design with Hyatt Roller Bearings—the most complete line of radial bearings available anywhere.

* * *

Take advantage of the design flexibility offered by the wide range of sizes and types of bearings in the Hyatt line. If you are not familiar with the complete Hyatt line, write for our general catalog No. 150, Hyatt Bearings Division, General Motors Corporation, Harrison, New Jersey.



HYATT ROLLER BEARINGS



Pilot Electroplating Line — *Scratchboard Drawing for Pittsburgh Steel Company by A. B. Sefcik*

Progress in Steel—by Accelerated Research

Advanced methods of pre-coating strip steel with non-ferrous metals are born in the laboratory and developed on the pilot line shown above in the Thomas Strip Division of Pittsburgh Steel Company. By applying the accumulated knowledge and techniques of a quarter century of pioneering, Thomas engineers are continually solving special problems for many manufacturers by one of several methods of pre-coating cold-rolled strip steel.

The use of pre-coated Thomas Strip results in the elimination or reduction of plating costs—provides an inside-and-out quality finish—protects against corrosion—eliminates steps in process cycle—saves handling, preparation, and cleaning costs. Thomas Strip is pre-coated electrolytically with zinc, copper, brass, nickel, lead alloy, and chromium. It is also hot dip tin and lead alloy coated and lacquer coated in a variety of colors. If you use strip steel in your manufacturing operations, it will pay to investigate the savings possible with Thomas Strip.

The Thomas Strip Division was acquired by Pittsburgh Steel as a part of its Program of Progress which has as its objectives increases of 82% of finished product capacity and 50% in ingot capacity. The major steps in this $60-million program outlined below are designed to answer the universal demand for more steel to meet the growing needs of the defense program and to help promote our civilian economy as well.

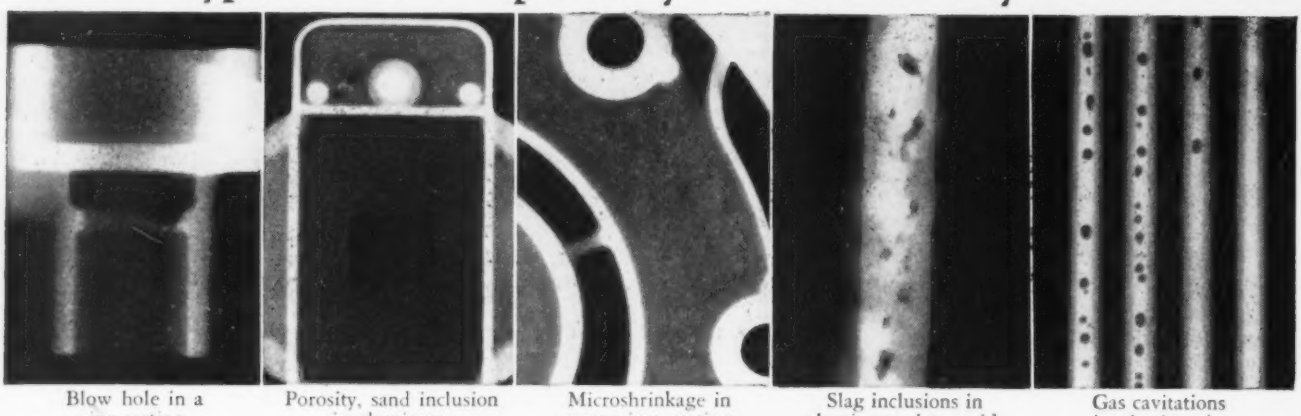
Program of Progress

Acquisition of Thomas Steel Company	100% Complete
Installation of new 66-inch High Lift Blooming-Slabbing Mill	100% Complete
Increase of Blast Furnace Capacity by 12% Per Year	60% Complete
Increase of Open-Hearth Capacity by 50% Per Year	63% Complete
Installation of Continuous 66-inch Hot Rolled Sheet-Strip Mill	79% Complete
Installation of 66-inch Cold Rolled Sheet-Strip Mill	74% Complete

Pittsburgh Steel Company

Pittsburgh, Pennsylvania

Typical sections inspected by GE OX-140 x-ray units



Blow hole in a zinc casting. Porosity, sand inclusion in aluminum. Microshrinkage in magnesium casting. Slag inclusions in aluminum plate weld. Gas cavitations in plastic rods.

Put quality control on a production-line basis

GE semi-automatic OX-140 provides fast, accurate x-ray inspection of large production lots

Quality control engineers are always under pressure not to delay production schedules for testing and inspection. General Electric offers you x-ray inspection apparatus that permits both speed and control of processes—the semi-automatic OX-140.

This unit is designed for fast, economical inspection of materials like aluminum, magnesium, plastics, and handles sheets, tubes, rods — as well as cast sections.

Compact, flexible, fully protected and safe, the OX-140 features full built-in radiation protection without the expense of special rooms. "Open down" doors guard against operator injury. The doors also automatically initiate x-ray exposure on closing.

If you have an inspection problem in your plant, call the GE x-ray representative near you. The OX-140 is just one of many x-ray units General Electric has developed to help industry do a better job . . . faster. For literature, write X-Ray Department, General Electric Company, Milwaukee 1, Wisconsin, Rm. **AR**-11.

GENERAL ELECTRIC

Semi-automatic OX-140 has two tables on either side that support pre-setup trays of parts on ball bearings. Work moves continuously because personnel doesn't have to leave the room during exposure. One aircraft company radiographs four times as many parts with their OX-140 as they formerly had been able to inspect with conventional unit. Fewer man-hours are needed.

Saves Time... Cuts Costs

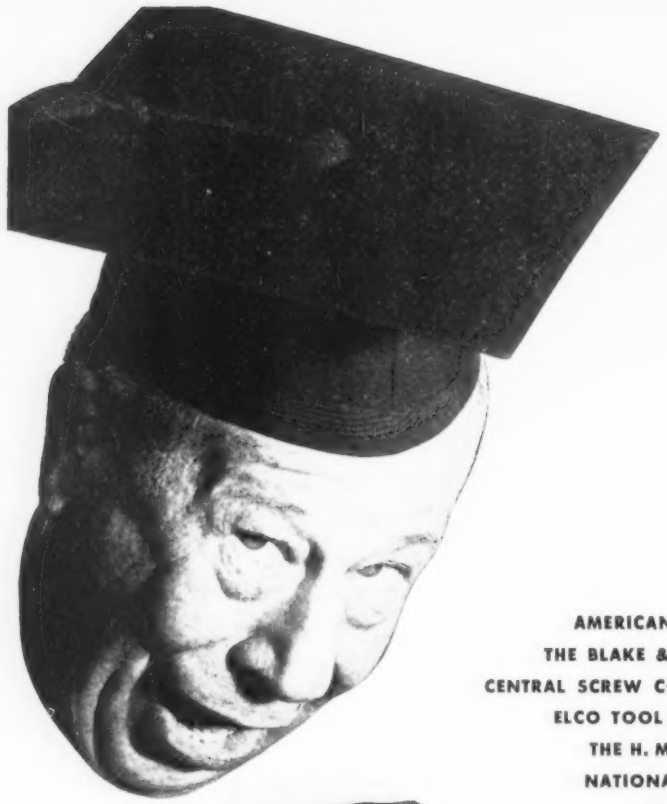
Rotary Planer . . . do milling jobs in one-third to one-seventh of time on an Espen-Lucas Rotary Planer.

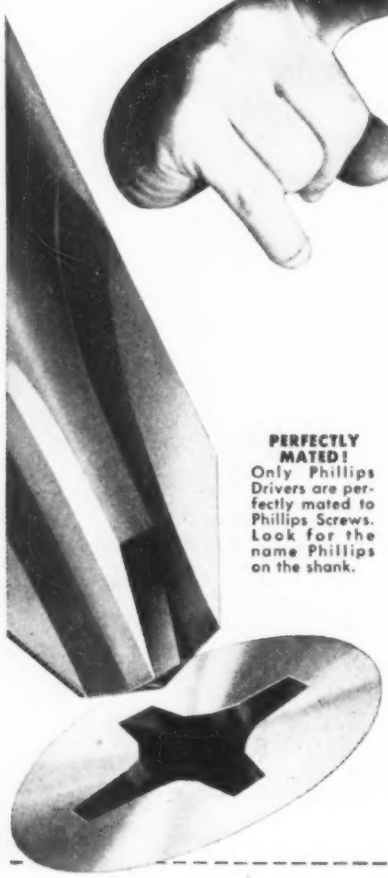
Big Sawing . . . production cutting of large stock —rapid, easy, straight-to-a-line piece after piece—on Espen-Lucas Cold Sawing Machines.

The **ESPEN-LUCAS** *Machine Works*

Front Street and Girard Ave., Phila. 23, Pa.

BUILDERS OF LARGE COLD SAWING MACHINES • ROTARY PLANERS • COLUMN FACERS • HEAVY TYPES OF SPECIAL MACHINERY





PERFECTLY MATED! Only Phillips Drivers are perfectly mated to Phillips Screws. Look for the name Phillips on the shank.

Q. *How can they increase your sales?*

AMERICAN SCREW CO. • ATLANTIC SCREW WORKS, INC.
THE BLAKE & JOHNSON CO. • CAMCAR SCREW & MFG. CORP.
CENTRAL SCREW CO. • CONTINENTAL SCREW CO. • THE EAGLE LOCK CO.
ELCO TOOL AND SCREW CORP. • GREAT LAKES SCREW CORP.
THE H. M. HARPER CO. • THE LAMSON & SESSIONS CO.
NATIONAL LOCK CO. • THE NATIONAL SCREW & MFG. CO.
PARKER-KALON CORP. • PHEOLL MFG. CO.
ROCKFORD SCREW PRODUCTS CO. • SCOVILL MFG. CO.
SHAKEPROOF INC. • SOUTHERN SCREW COMPANY
THE SOUTHINGTON HDWE. MFG. CO. • STERLING BOLT CO.
STRONGHOLD SCREW PRODUCTS, INC. • WALES-BEECH CORP.

A. *Through the Phillips Cross-Recessed-Head Screws that they manufacture.* These famous fasteners are a mark of quality manufacture to your customers. Phillips Screws are nationally advertised in The SATURDAY EVENING POST as the clue to quality: X marks the spot. You'll find them a real sales-plus on your product. What's more, you save time, work, money with Phillips Wood, Machine, Tapping Screws or "Sems." They cut driving time up to 50%, set up tighter, add structural strength. With Phillips Screws you'll find production power driving practical, cut lost time due to accidents. Be sure to cash in on their many benefits.

X marks the spot... the mark of extra quality

PHILLIPS *Cross-Recessed-Head* SCREWS

As Advertised in The Saturday Evening POST

THE FASTENERS OF TODAY . . . AND OF THE FUTURE

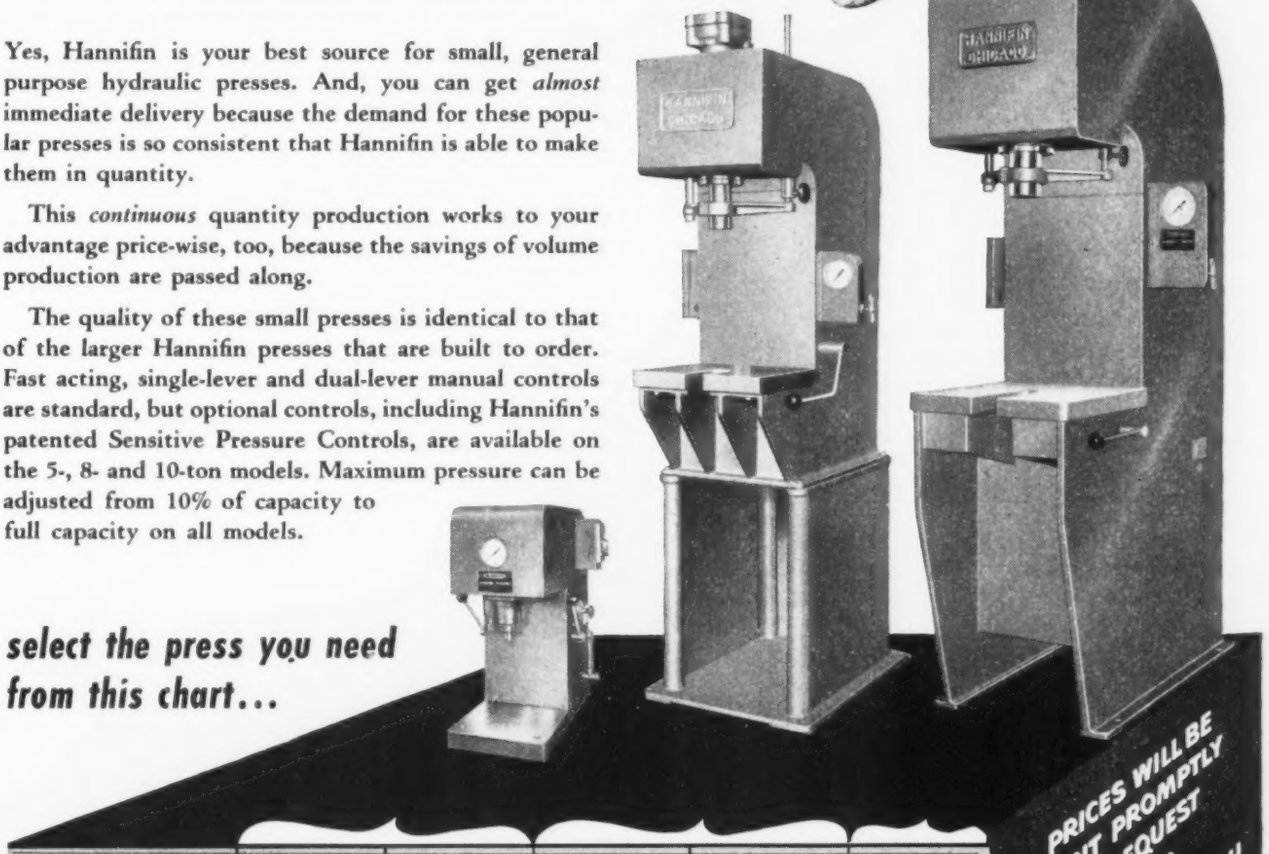
"where can I get a good, small general purpose hydraulic press . . . *quickly?*"

"HANNIFIN HAS THEM FROM 1 TO 10 TONS FOR PROMPT DELIVERY!"

Yes, Hannifin is your best source for small, general purpose hydraulic presses. And, you can get *almost* immediate delivery because the demand for these popular presses is so consistent that Hannifin is able to make them in quantity.

This *continuous* quantity production works to your advantage price-wise, too, because the savings of volume production are passed along.

The quality of these small presses is identical to that of the larger Hannifin presses that are built to order. Fast acting, single-lever and dual-lever manual controls are standard, but optional controls, including Hannifin's patented Sensitive Pressure Controls, are available on the 5-, 8- and 10-ton models. Maximum pressure can be adjusted from 10% of capacity to full capacity on all models.



select the press you need from this chart...

CAPACITY, tons	1-ton	2-ton	5-ton	8-ton	10-ton
MODEL NUMBER	F-10	F-20	F-50	F-80	F-101
RAM SPEED (in.–min.) Down	400	190	120*	73*	130
RAM SPEED (in.–min.) Up	800	345	240*	151*	254
PUMP (gpm.)	3.3	3.3	5*	5*	11
MOTOR (hp)	1½	1½	2*	2*	5
STROKE (in.)	6	6	10	10	12
GAP (in.)	10	10	16	16	22
REACH (in.)	6	6	7½	7½	10
BULLETIN	H-784	H-784	135	135	134

PRICES WILL BE SENT PROMPTLY ON REQUEST

Check THE BULLETINS YOU WANT ON THE COUPON

Supplied with larger motor and pump when higher ram speed is required.

Hannifin Representatives Are at Your Service in These Leading Industrial Centers

Atlanta, Buffalo, Cincinnati, Cleveland, Dallas, Dayton, Denver, Detroit, Houston, Los Angeles, Milwaukee, Minneapolis, Moline, New Orleans, New York, Philadelphia, Pittsburgh, St. Louis, Seattle; Richmond, Va.; Rochester, N. Y.; South Bend, Ind.; Washington, D. C.; Worcester, Mass. In Canada: TEM Sales Company, Toronto

HANNIFIN

Hydraulic and Pneumatic Presses from ½ Ton to 150 Tons
Air and Hydraulic Cylinders • Riveters • Air Control Valves

mail the coupon!

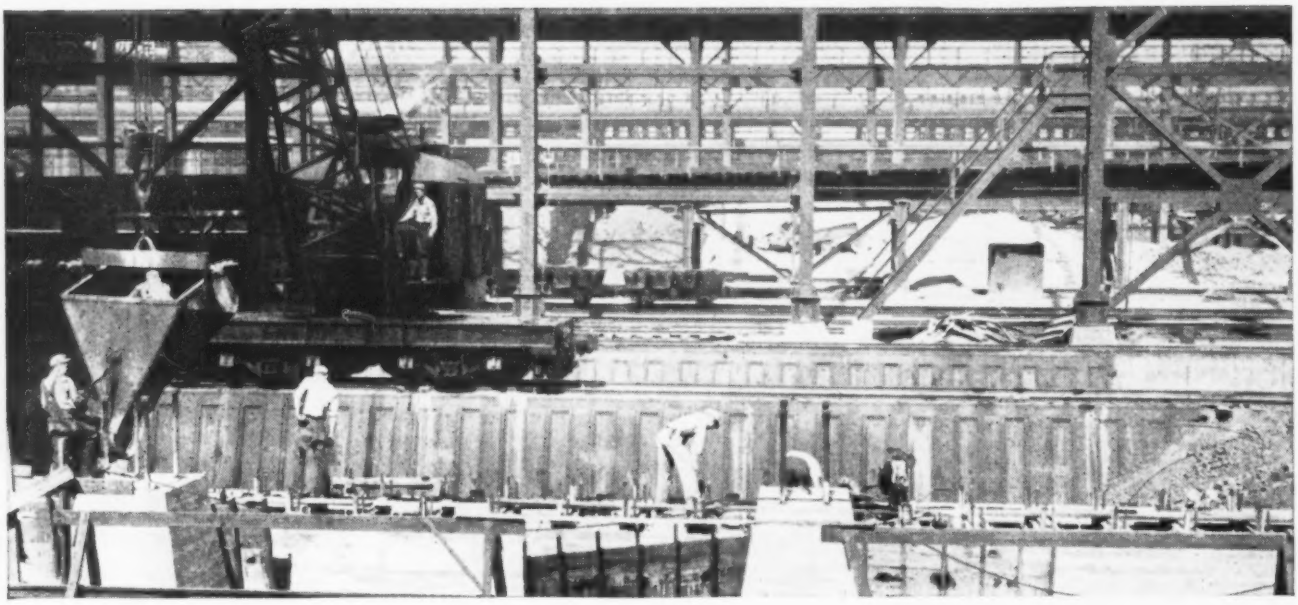
Hannifin Corporation
1113 S. Kilbourn Ave., Chicago 24, Ill.
Please send bulletins checked, together with prices:

☐ Bulletin H-784 ☐ Bulletin 135 ☐ Bulletin 134

Name.....
Position.....
Company.....
Address.....
City.....*State*.....

From hot slag to heat treatment...

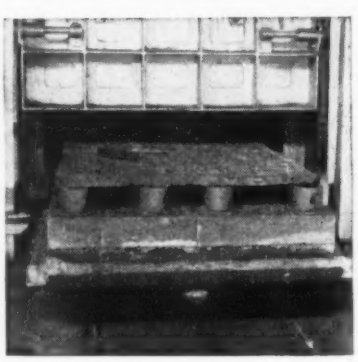
LUMNITE* saves time, cuts costs



CONSTRUCTION TIME SAVED HERE: Inland Steel Company, Indiana Harbor, Ind., made fast work of slag-pit retaining walls above. Three sets of walls, 500 feet long, resist heat in pits where hot slag is dumped and broken up with huge weights. Concrete made with Lumnite Cement is simply poured in place behind steel piling . . . *reaches service strength in 24 hours or less.* For speed, you can't beat simple monolithic concrete construction with time-saving Lumnite Cement!

OPERATING COSTS CUT HERE: Before the Attalla (Ala.) Pipe and Foundry Co. could use lift trucks for bringing scrap to cupolas, they had to build a ramp that would endure the blazing charges dropped daily by cupolas on either side. At right is their solution—heat-resistant concrete made with Lumnite calcium-aluminate cement. Tough Lumnite-made floors help cut operating costs!

MAINTENANCE REDUCED HERE: 6 months was average life of car tops exposed to quick quenching from 1700° F. at St. Louis (Mo.) Steel Casting Company. But refractory concrete car tops made with Lumnite Cement, such as the one at right, have lasted for several years. Refractory concrete has low volume change to withstand severe thermal shock; takes heat to 2600°F. Helps cut maintenance in furnace and door linings, base pads, foundations and stacks as well.



FOR CONVENIENCE, you may prefer prepared castables (Lumnite Cement plus aggregates selected for specific temperature and insulation service—add only water). They're made by refractory manufacturers and sold through their dealers. For more information, write, Universal Atlas Cement Company (United States Steel Corporation Subsidiary), 100 Park Avenue, New York 17, N. Y.

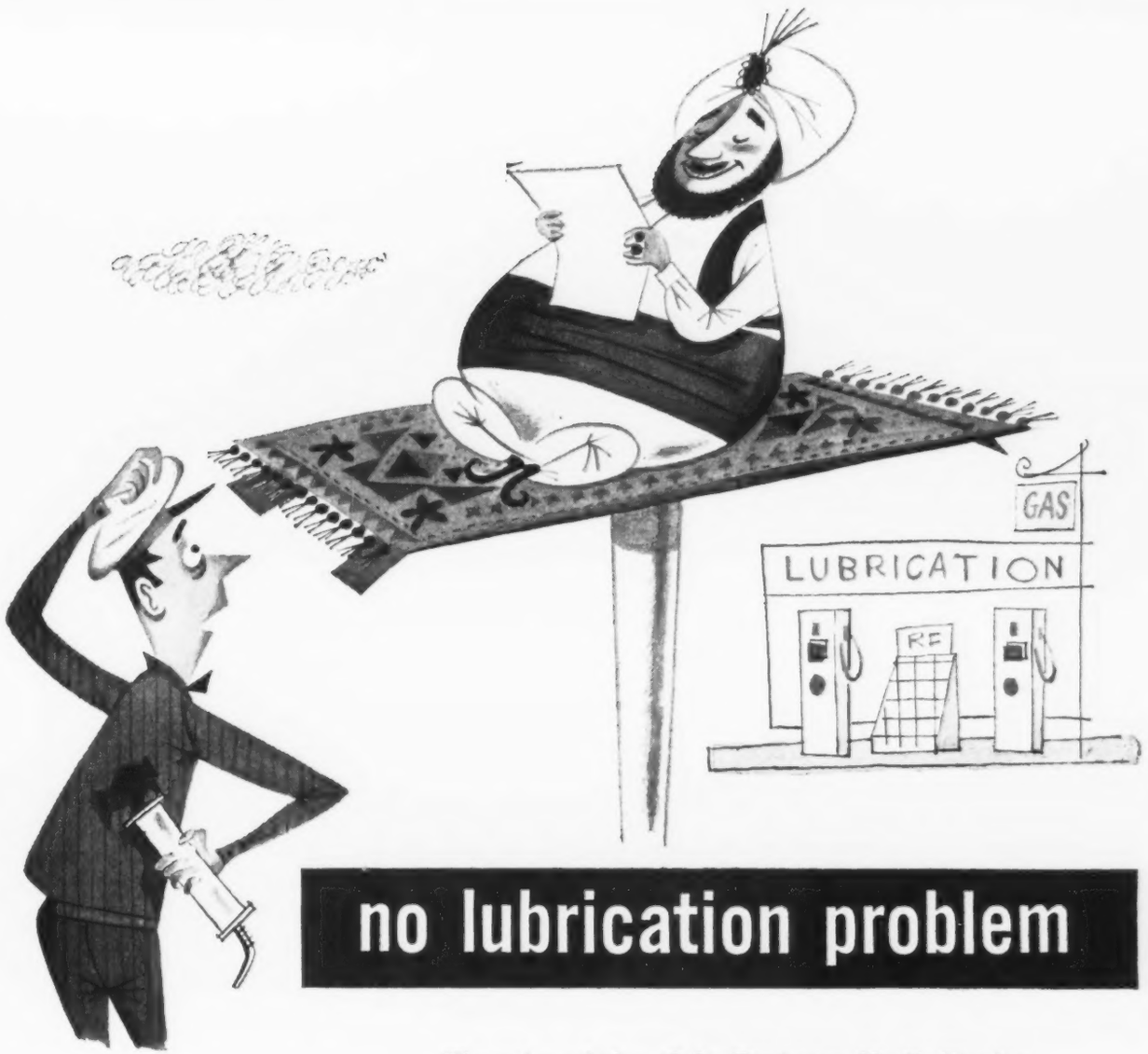
**"LUMNITE" is the registered trade mark of the calcium-aluminate cement manufactured by Universal Atlas Cement Company.*

IA-L-71

ATLAS® **LUMNITE for INDUSTRIAL CONCRETES**

REFRACTORY, INSULATING, OVERNIGHT, CORROSION-RESISTANT

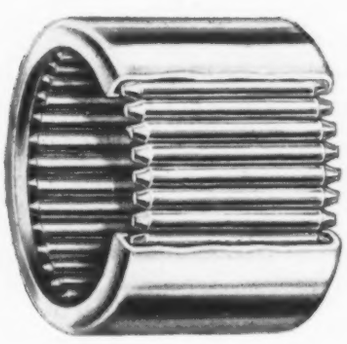
"THE THEATRE GUILD ON THE AIR"—*Sponsored by U. S. Steel Subsidiaries — Sunday Evenings — NBC Network*



no lubrication problem

The unique design of the Torrington Needle Bearing minimizes lubrication problems. The turned-in lips of the outer shell retain a large reservoir of oil and grease. And the full complement of small diameter rollers carries a thin lubricating film to all bearing contact surfaces. In some applications, the original lubricant will last for the life of the product.

Have you considered this and other Needle Bearing advantages—such as high radial load capacity, light weight and compact size—in terms of *your* product? Torrington engineers will welcome the opportunity to give you full details.



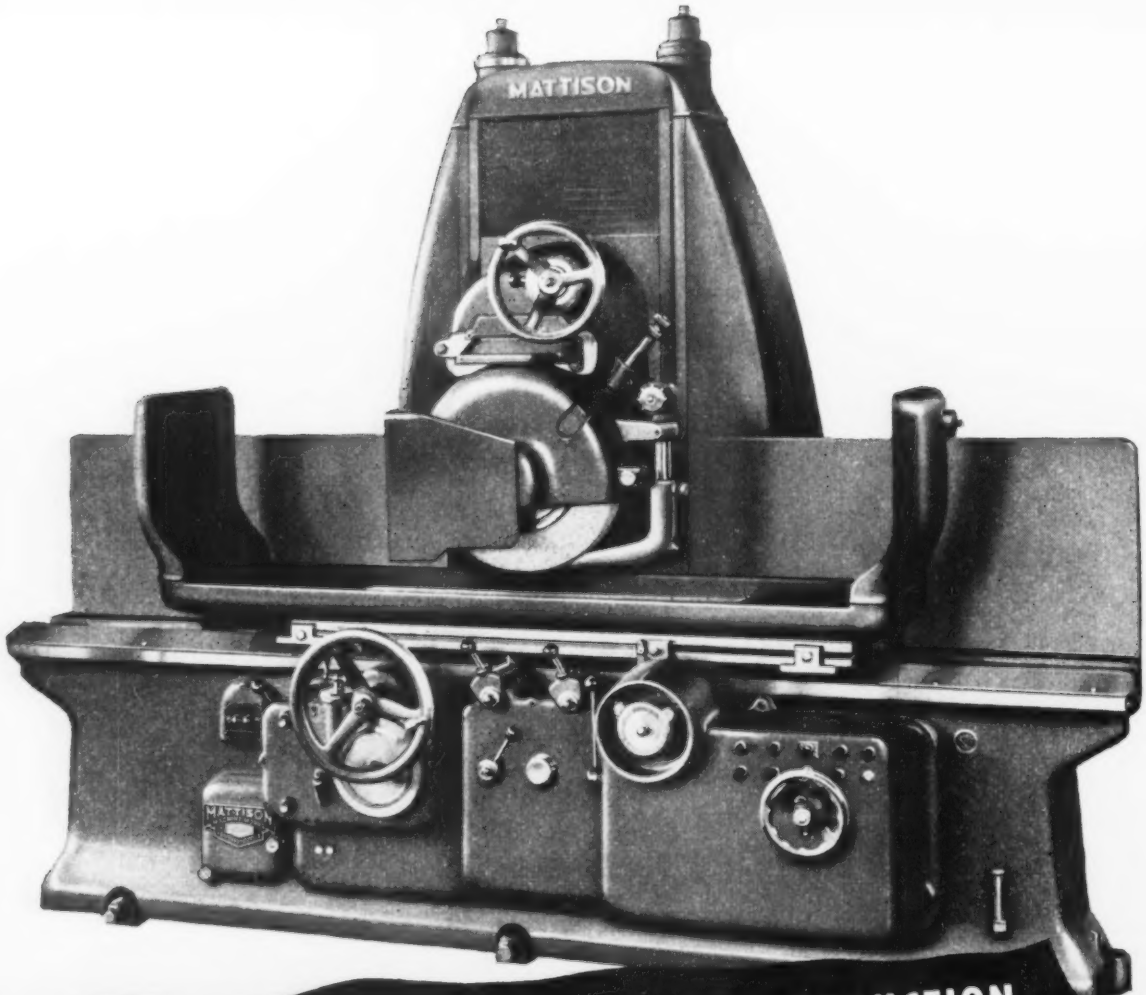
THE TORRINGTON COMPANY

Torrington, Conn. South Bend 21, Ind.

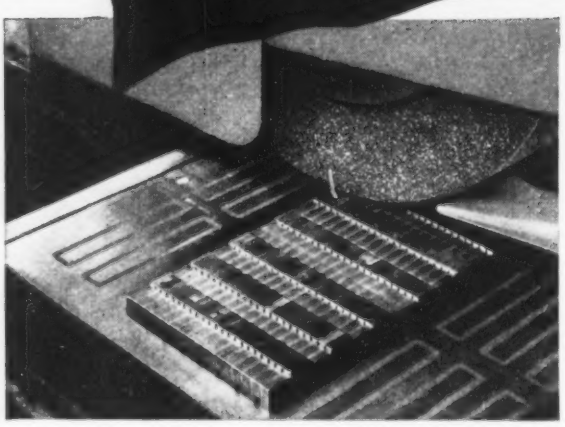
District Offices and Distributors in Principal Cities of United States and Canada

TORRINGTON NEEDLE BEARINGS

Needle • Spherical Roller • Tapered Roller • Straight Roller • Ball • Needle Rollers



HERE'S A CHANGE THAT INCREASED PRODUCTION FROM 30 PER HOUR TO 200 PER HOUR



Both sides of type-stamps are now ground 200 per hour on a Mattison Grinder. Previous production — 30 per hour.

● Because of the greater load and grinding area of their Mattison High Powered Precision Surface Grinder, Geo. T. Schmidt, Inc., Chicago, Illinois have been able to effect considerable savings in grinding time over their previous method. As an example — the type stamps shown in the picture above were formerly ground a few pieces at a time on a small grinder — 30 per hour. The Mattison Grinder they are now using provides larger table space and a larger grinding wheel together with the necessary power and stability to permit the grinding of more pieces per load at a production rate of 200 per hour. Similar results are obtained on other parts.

Mattison High Powered Precision Surface Grinders have the high power and rugged double-column construction for rapid stock removal and the precision necessary for high quality finish and accuracy to close limits.

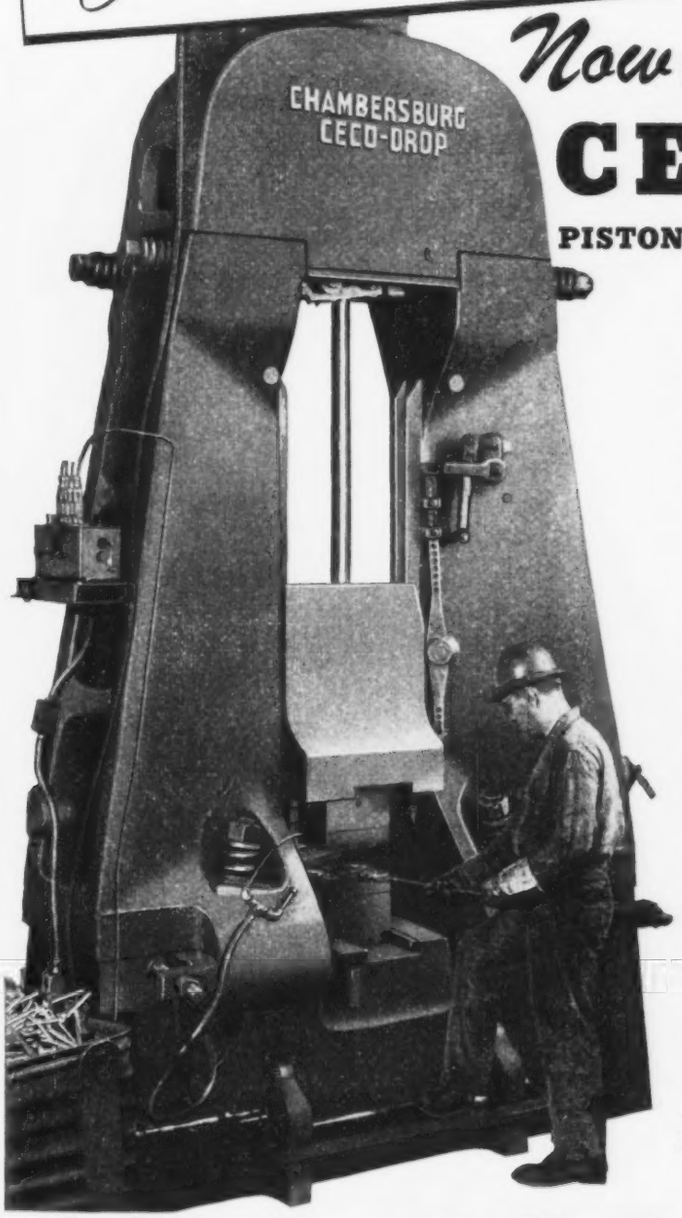
This combination not only will enable you to step up production on small parts, but permits grinding large work which previously could not be handled. For further information send for free circular.

MATTISON MACHINE WORKS

ROCKFORD · ILLINOIS

WITH COMPETITION GETTING KEENER—

Down Time becomes more costly!



***Now* is the time to ask about the**

CECO-DROP

PISTON-LIFT, GRAVITY DROP HAMMERS

High labor costs, high material costs can only be offset by increased production per machine. If your board drop hammers are showing signs of use, more and more time and expense is necessary for board replacement, adjustments and repairs; don't wait—investigate CECO-DROP piston-lift, gravity drop hammers now. (Especially consider the fact that Ceco-Drop upper works can probably be installed on your present board drop hammer anvils.)

CECO-DROP HAMMERS are the result of more than a half century of experience in the manufacture and design of hammers. They cost less to operate. There are no board changes, no friction adjustments, and lubrication is automatic. Treadling the Ceco-Drop is easy and not fatiguing, and die alignment is held. The unique stroke adjustment and short stroke control afford a wide range of operation.

Write today for information about Ceco-Drop Hammers. Ask for Bulletin 11-L-0. You'll be glad you did.

CHAMBERSBURG ENGINEERING COMPANY, CHAMBERSBURG, PA.

CHAMBERSBURG

THE HAMMER BUILDERS

The U. S. Steel Supply team that gives you

personalized service

He specializes in solving your technical troubles!

OUR product specialist is qualified to give you expert advice on the selection of steel for a particular purpose, and on the choice of tools, equipment and machinery that can frequently speed up your production. He can interpret and develop specifications to fit your needs, and he can advise on the methods of handling the various kinds of steel and steel products during your production operations. Often he can save you time or money, or help you meet a delivery date by suggesting alternate materials for your product. And at his finger tips is the latest information about government restrictions, expected availabilities of special grades of steel, and similar subjects.

You can put a product specialist's talent to work on your problem through your U. S. Steel Supply salesman. Your salesman is the "quarterback" of the U. S. Steel Supply team of experts. When he knows your needs, he will put the right man or combination of men to work to satisfy them quickly.

YOUR "ONE CALL" SOURCE OF STEEL SERVICE

U.S. STEEL SUPPLY

UNITED STATES STEEL SUPPLY DIVISION, UNITED STATES STEEL COMPANY
HEADQUARTERS: 208 So. LA SALLE ST., CHICAGO 4, ILL. WAREHOUSES COAST-TO-COAST

Warehouses and Sales Offices: BALTIMORE · BOSTON · CHICAGO · CLEVELAND · LOS ANGELES · MILWAUKEE · MOLINE, ILL. NEWARK · PITTSBURGH · PORTLAND, ORE. · ST. LOUIS · TWIN CITY (ST. PAUL) · SAN FRANCISCO · SEATTLE

Sales Offices: INDIANAPOLIS · KANSAS CITY, MO. · PHILADELPHIA · PHOENIX · ROCKFORD, ILL. · SALT LAKE CITY · SOUTH BEND · TOLEDO TULSA · YOUNGSTOWN

UNITED STATES STEEL

The Iron Age
FOUNDED 1855

THE IRON AGE Newsfront

NEW AUTOMATIC DROP FORGING machines may replace drop hammers at Packard. Company has ordered five of the big new automatic impact units for jet blade forging, plans in time to redesign auto parts--connecting rods, steering knuckles--for the new machines. They're faster and don't vibrate.

ENAMELING SHEETS FOR TV PICTURE TUBE CONES will go into commercial production in Philadelphia within a week or so. Enameled on both sides, they replace more costly stainless steel. Enamel improves glass-to-metal bond.

MECHANIZED COAL MINING HAS DISADVANTAGES. Steel producers say an increasing percentage of coal produced by mechanical methods is in fines. Fines absorb more water in the washing process than larger lumps. More elaborate moisture removal equipment is needed.

LOWER FREIGHT RATES ON SCRAP are expected within the next 2 weeks. If relief from Washington materializes, freight on point to point shipments may be reduced by 10 to 15 pct, dealers and brokers say.

TITANIUM SAND MINING ON FLORIDA BEACHES may be done with an arcwelded steel prime separator. Separating tests are being conducted by Hobart Bros. Co. and Florida Ore Processing Co.

VENEZUELAN STEEL PRODUCTION FACILITIES are being studied by the South American government with the assistance of U. S. Steel Corp. The Corporation is cooperating in a study of the feasibility of establishing steel production facilities there.

PROPERTIES OF STEEL FROM POWDER METAL will be possible soon. A new powdered metal product will have tensile strength of low carbon steels, high ductility, can be hardened by cyaniding, case hardening.

BULK SHIPMENTS OF TACONITE BY 1957 will be made by one eastern mill. Two ore ships of 30,000 tons capacity each are being built in Britain to haul the taconite which can be refined to 64 pct Fe content.

HOLLOW COPPER JET ENGINE BLADES CLAD with N155 high temperature alloy will soon be tested. These blades are the air-cooled type.

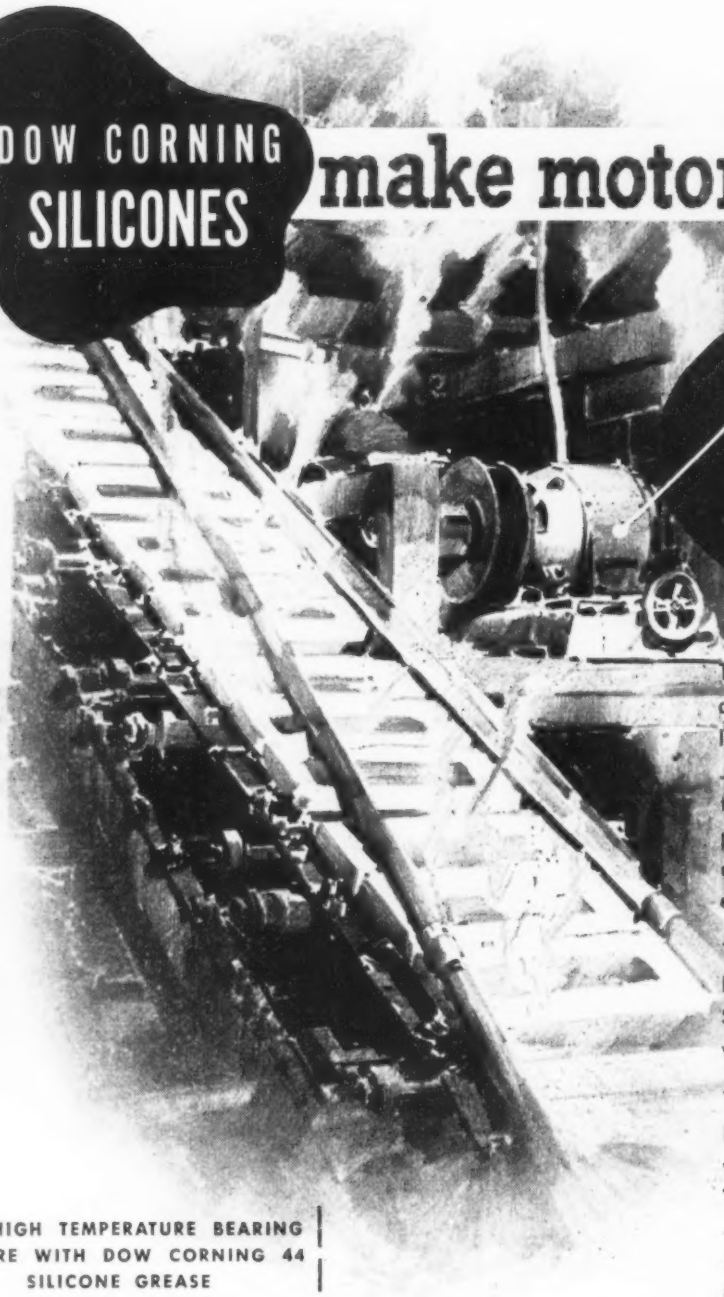
GEAR MANUFACTURERS ARE RELAXING. New tight specifications covering gears for Naval deck and steering equipment seem to have been a trial balloon and will probably be modified. Many firms would have difficulty meeting the new specs with present gear cutting equipment.

CALCIUM IS BEING TESTED AS A COATING MATERIAL prior to annealing coils of electrical steel. The calcium is deposited on the strip by vapor deposition methods.

INTENSE AUTO INDUSTRY COMPETITION expected in 1953 is being reflected in advertising budgets. Introduction of almost every new model will be accompanied by big boosts in advertising budgets--some 60 pct greater than for 1952.

DOW CORNING SILICONES

make motors last longer



Paid for itself 30 times in 2 years

Tough operating conditions are the order of the day for the 5 hp hot-ingot conveyor motor at The Infeld Metals Corporation in Waterbury, Conn. Jogged on a 20-second cycle, it never gets up to speed. An unending procession of freshly-poured ingots at 600° to 2100° F passes within a few feet of it. The quenching system keeps it enveloped in clouds of steam.

The motor used to fail at least every 3 weeks. Rewinding with Class A insulation cost about $109. Down time and lost production expenses were about the same.

Two years ago the motor was rewound by the Electric Motor Repair Company of Waterbury with Dow Corning Silicone (Class H) Insulation. The initial cost was higher—approximately $235—but the motor has not failed since. Based on the 3-week service life of Class A, that means Class H has paid for itself over 30 times, saved $3471 in rewind costs alone.

That kind of performance in thousands of installations has proved that Dow Corning Silicone Insulation has 10 to 100 times the life expectancy of the next best class of insulating materials; increases the power pound ratio in electrical equipment by as much as 50%.

CUT HIGH TEMPERATURE BEARING FAILURE WITH DOW CORNING 44 SILICONE GREASE

In open and single shielded bearings designed for high temperature operation, Dow Corning 44 Silicone Grease has 8 to 10 times the life expectancy of conventional greases. It gives lifetime lubrication in permanently sealed bearings.

mail this coupon Today

Dow Corning Corp., Dept. O-23 Midland, Mich.
Please send me:
- ☐ Catalog of Class H Insulating Materials.
- ☐ List of Class H motor repair shops.
- ☐ Data on Silicone Grease for motor bearings.
- ☐ 32-page booklet entitled "What's A Silicone?"

Name_____

Company_____

Street_____

City_____ Zone_____ State_____

DOW CORNING CORPORATION
Midland, Michigan

DOW CORNING SILICONES

Atlanta • Chicago • Cleveland • Dallas • New York • Los Angeles • Washington, D.C.
In Canada: Fiberglas Canada Ltd., Toronto • In England: Midland Silicones Ltd., London

STEEL: Strike Saps Profits, Drops Output

Earnings, output, shipments skid for third quarter and first 9 months of 1952 . . . Excess profits tax feature of some help . . . Steel firm heads assail controls laws—*By W. V. Packard.*

Impact of the steel strike last summer continues to be reflected in operating and financial reports of steel companies. Earnings, production, shipments for both the third quarter and first 9 months of this year are well below those reported for the corresponding periods last year.

Preliminary reports indicate that steel firms earned about 24 pct less in the third quarter of 1952 than they did in the third quarter 1951. For the first 9 months of this year their indicated earnings are about 38 pct below the corresponding period last year.

Most of Industry—These results are considered approximate, since a few companies still had not reported their earnings at press time. However, they are based on reports from companies representing the bulk of the industry's ingot capacity.

The earnings picture would have been even darker for some firms had it not been for excess profits tax factors. Income statements were altered by these two considerations in tax accounting: (1) Operations lower than had been anticipated permitted reduction in provision for excess profits tax made earlier this year. (2) Some income statements reflected estimated excess profits tax refunds for 1951 arising from an unused excess profits tax exemption for the current period.

The law permits credits accruing from unused exemptions to be applied to either a previous or subsequent period. Thus, a much better fourth quarter profit is expected, because a number of steel companies applied only part of their tax credit. Some firms apparently saved part of their credits to apply against anticipated high income in the fourth quarter.

How Strike Hit — The 54-day strike, which so adversely affected operating and financial results, was almost equally divided between the second and third quarters. Twenty-six days of the strike fell in the third quarter period.

Steelmaking operations in the third quarter of this year averaged 70.3 pct of rated capacity, compared with 66 pct in the second quarter and 99.4 pct in the third quarter of last year. Operations for the 9-month period this year averaged 79 pct, compared with 100.5 for the similar period last year.

The industry produced 19.2 million net tons of ingots in the third quarter 1952, compared with 26.1 million tons in third quarter '51. In the first 9 months of this year production totaled 64.2 million net tons, compared with 78.4 million tons in the similar period last year.

"End Controls!"—Agitation for elimination of government controls over steel is spreading like wildfire.

Eugene Grace, Bethlehem chairman, was especially vehement in demanding an early end to "this nonsense." He made these points:

(1) "Steel for the entire industrial expansion program—to expand steel, aluminum and other industries for defense and other purposes—the steel for that entire program will be fully delivered during the first quarter of 1953. Eighty pct of that program is taken care of right now.

(2) "By the end of November

Steel Company Earnings

Company	Third Quarter '52	Third Quarter '51	Nine Months '52	Nine Months '51
U. S. Steel	$30,405,472	$27,936,060	$96,158,606	$134,733,557
Bethlehem Steel	17,116,975	18,460,372	41,421,705	67,155,347
Republic Steel	5,158,092	12,496,762	21,420,148	39,226,256
Jones & Laughlin Steel	810,000	8,101,000	5,411,000	23,837,000
National Steel	7,334,419	10,585,971	22,781,009	34,479,198
Armco Steel	7,740,292	6,094,354	22,305,678	26,739,056
Youngstown	2,546,846	7,194,334	11,051,464	23,549,078
Inland Steel	4,794,694	7,748,751	16,139,754	25,261,849
Wheeling Steel	840,523	3,320,610	4,059,042	11,622,307
Sharon Steel	1,398,246	2,163,061	2,338,768	7,416,400
Colorado Fuel & Iron	577,900	2,045,711	.....	.....
Kaiser Steel	1,666,492	2,515,677	.....	.....
Crucible Steel	1,260,575	2,018,579	.....	6,625,910
Pittsburgh Steel	1,811,721	1,533,284	2,212,612	4,937,457
Barium Steel	858,978	614,206	2,176,701	3,749,330
Allegheny Ludlum Steel	997,000	2,213,161	.....	7,321,240
Granite City Steel	.....	.....	2,730,527	4,387,845
Alan Wood Steel	537,051	327,307	1,323,130	1,721,104
Copperweld Steel	.....	.....	1,464,553	2,304,971
Rotary Electric Steel	.....	815,624	1,277,190	2,154,932
Keystone Steel	1,180,913	1,117,677	.....	.....
Continental Steel	164,592	268,085	924,604	1,316,918
Eastern Stainless Steel	.....	.....	544,195	885,785

STEEL: Items Leave Critical Group

DPA lifts plates, carbon bars, semifinished steel and seamless tubing from "most critical" category . . . Action reflects easing of supply . . . Warning on aluminum sounded.

Recognition of the easing of the steel supply picture was extended last week by Defense Production Administration in removing plate, cold-drawn carbon bars, hot-rolled bars, semifinished steel, and seamless tubing from the "most critical" category.

These items are still in Group I (in short supply), however, in the DPA list of basic materials and alternates.

In this newest reshuffling of the list, die blocks were eased down from Group I to Group III (fair to good supply). At the same time, all castings under 3000 lb were dropped from Group I to Group II (near balance).

Changes in nonferrous listings were held to the shifting of iridium from Group I to II and osmium from Group II to III. Fluorspar and kyanite were also moved over from Group I to III.

Still remaining as most critical in the new listing are gray iron castings over 3000 lb, carbon steel castings over 3000 lb, and gray iron alloy over 3000 lb.

Still Critical—Titanium, cobalt, columbium, molybdenum, nickel, and tantalum all retain their most critical designations.

Change in the steel classifications, said John Timberlake, head of the NPA Iron and Steel Div., "reflects the continued efforts of the steel industry to continue production at a maximum."

Aluminum remains in the Group II classification. But it is pointed out that serious setbacks have been suffered by the industry by reason of power shortages caused by dry weather.

According to Sam Anderson, deputy NPA administrator, "unless heavy rains come soon, production during the fourth quarter and probably the first quarter will be appreciably reduced below earlier estimates and the supply will be tight."

Sulfur was removed from the most critical category and dropped down to the fair-to-good Group III classification. Some 35 chemicals were removed from the list entirely and about 20 others were reclassified.

Small Ore Producers Subsidy Set

Small producers of columbium and tantalum bearing ores are now being cut in on the government's subsidy program because of a change in procurement policy.

Under the amended regulation, Defense Materials Procurement Agency will buy small lot shipments from domestic producers delivered to its Spruce Pine, Franklin, and Custer purchase depots. Previously, shipments could not be less than 2000 lb.

These small lots must contain a minimum of 50 pct columbium and tantalum pentoxide (in any ratio). Payment will be made at a flat rate of $1.70 per lb of acceptable grade material, this price including the subsidy or "bonus" allowance.

Special Report

Continued

military steel deliveries delayed by the strike will all be caught up.

(3) "In the second quarter of 1953 we (the industry) expect to produce 29 million tons of steel. That's 11 pct more than in the 1951 period. The increased production alone is enough to take care of all military needs.

(4) "Now can you tell me why in hell we are continuing controls . . . when it is admitted the most the military can take is 10 to 12 pct of production?"

Blow Up Shortages—Mr. Grace also blasted government planners for exaggerating steel needs to create apparent shortages. He said three huge atomic energy installations would take a total of 125,000 tons of fabricated steel—less than 3 months production of Bethlehem.

Ben Fairless, chairman of U. S. Steel said "I never believed in controls at any time. I feel whatever reasons there may have been for having controls are rapidly diminishing. But you can't get rid of them overnight. You have to unwind them slowly. Good judgment is needed."

Mr. Fairless said the coal wage increase would raise steelmaking costs $1 a ton of finished steel, unless it is offset by greater productivity in the mines.

Steel executives generally felt safe in predicting full operations through the first quarter. Though most of them shied away from guessing beyond that, they gave solid indication that they do not expect business to go "haywire," even if there is some decline from record levels.

What's Tight — Products listed in very strong demand were plates, structurals, bars, electrical sheets. Sheets, strip, tinplate and other flat-rolled products were reported easier. Wire products (including nails) were reported in comfortable supply with business good.

As the cycle of industrial expansion and construction moves past its peak, steelmakers believe government and municipal construction can take up the slack—if pent-up programs are given the green light in time.

The industry has no serious raw material problems. Iron ore stocks are in pretty good shape, with little demand expected for all-rail shipment this winter. Scrap stocks are bulging, as they have been ever since heavy accumulation during the strike last summer.

TOOLS: Imports Hit Peak

U. S. takes $34 million worth of European machines in first 8 months of '52 . . . Compares to $2,291,042 for 1950 . . . Some tools now better, are designed for American manufacturing.

In the first 8 months of 1952, $34 million worth of European machine tools have been landed here on the sizeable export beachhead deeded to overseas tool builders by a rearmament-fashioned shortage.

These imports of foreign tools were made by American factories, both civilian and defense, to supplement production of American toolmakers who were flung into a rearmament market after postwar idling along.

What Tools U. S. Bought

Type	Total 1950	Total 1951	8 Mos. Total 1952
Gear Cutters	$42,871	$346,633	$265,145
Punches, Shears, Bar Cutters	56,230	216,339	156,584
Tools, Jig Boring...	528,252	987,486	1,306,108
Grinding Machines..	587,544	7,017,736	24,645,847
Metalworking Machines & Parts (not elsewhere specified) ..1,076,145		5,135,461	8,085,568
	$2,291,042	13,703,655	34,448,252

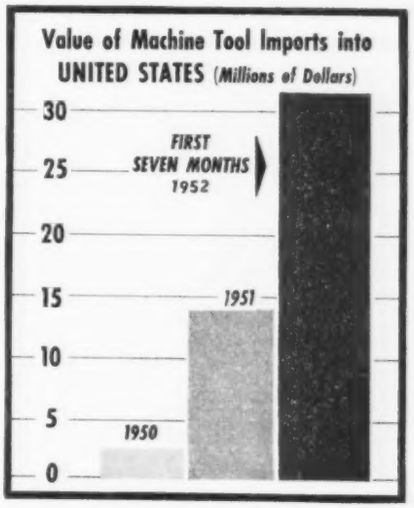
In 1950, dollar value of European exports to the U. S. stood at a scant $2,291,042. After Korea, America tooled up for war and delivery dates on domestic machines stretched into years. Military production had first call and civilian plants saw themselves squeezed out. Imports in 1951 rose to $13,703,655. Meanwhile, the home markets of overseas toolmakers was broadening and production was eating up all ground lost through war. Today the European machine tool industry is operating at rates higher than in World War II.

In 1951, American orders went to Europe like a flurry of Autumn leaves. The foundation for a whopping 1952 export rate was laid and materialized to full expectations. The $34 million in tools imported by Americans attests to that.

Now Slackening—It must be remembered that the phenomenally high European export rate is based on orders placed months before. (Delivery dates on catalog foreign tools run an average 6 to 9 months.) There are reports circulating that American orders are easing off, especially for the lighter, single-purpose tools.

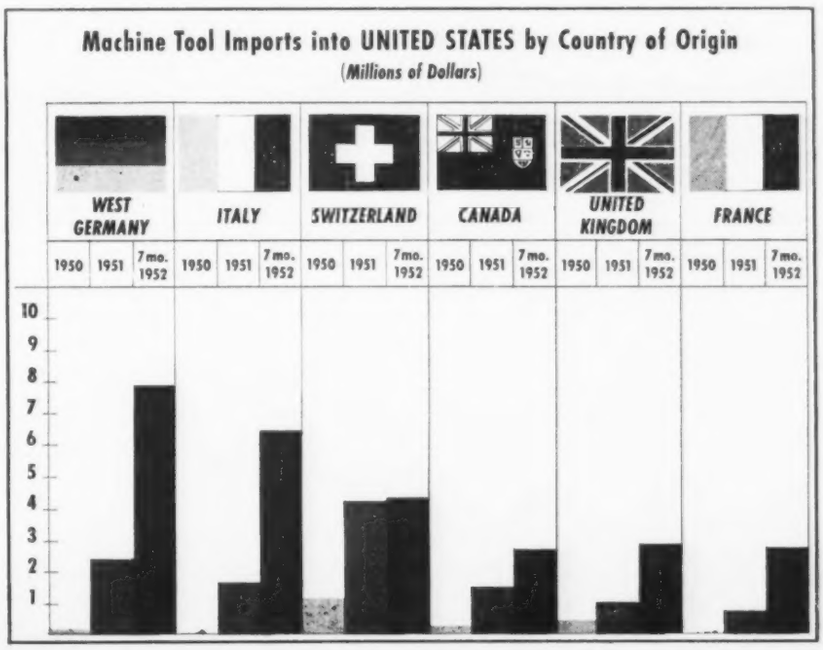
Volume of orders for heavier and more critical types of foreign tools remains fairly constant. But what European tool builders fear is the return to more normal delivery schedules by U. S. builders. This, they fear, would elbow them out of the American market in machines that directly compete with ours. Thus the import rate of 1953 may skid below that of 1952.

On some tools, the specialty of European producers, a U. S. market may continue indefinitely. But on tools that directly compete with the U. S. product, the Europeans may suffer substantial loss of sales. Overseas builders are realistic enough to know that American tools are preferred by American factories.



Had Wrong Idea—With the enlarged influx of European tools to America, came a greater respect for European technology. European tools have always been considered substantially inferior to the American. They were under-powered for American manufacture, were poorly weighted.

Of course, all this has not changed completely. However, European toolbuilders are putting more power into their machines and have put more sensible designs on the market.



STEEL: Indiana Harbor Growing Fast

Metalworking is spurting ahead in the Chicago area—and so is steelmaking . . . Youngstown Sheet & Tube is pushing its plant up to 2.5 million tons capacity—*By K. W. Bennett.*

Confident that its attentions will not be spurned, Youngstown Sheet & Tube is wooing the steel-hungry Chicago area with $160 million worth of new equipment. It is prepared to spend even more if its expansion program is encouraged.

Scheduled new equipment for the Indiana Harbor mill includes eight openhearths, one coke battery, one blast furnace, a blooming mill and related facilities.

Census figures give Youngstown good reason for its faith in the midwestern market. In 1939 Chicago, industrial heartland of the Midwest, sported 2023 metalworking firms. By 1949 the area had attracted a total of 3609, with more coming. Chicago's six-county metropolitan area went from 2510 firms in 1939 to 4416 in 1947. Total continues to climb.

Versatility—Youngstown's big target is a wider product mix. Temporary effect will be more ingots, followed by more slabs when spring brings the new blooming mill. The Midwest is still flirting with conversion steel, auguring well for boosted ingot and slab supplies.

Already in the act is a new eight-furnace openhearth melt shop. Four hearths were lit earlier this year (THE IRON AGE, May 22, 1952); a fifth more recently. The three remaining 250-ton furnaces will be fired next month. Total annual ingot capacity at Indiana Harbor will be kicked up to 2.5 million tons. Actual capacity is 1.95 million tons at this writing. Two 350-ton cranes will bring up the raw materials for cooking.

Area's Metalworking Growth
(Number of firms)

	1939	1947
Illinois	11,983	15,988
Indiana	4,192	5,408
Michigan	5,961	9,892
Wisconsin	6,334	6,979
Total (Four States)	28,470	38,267

Source: Bureau of Census

Blast Furnace—Pig production will go to 2 million tons per annum when a new 28-ft blast furnace is blown in shortly after New Year's. Company expects to tap 1600 tons of hot iron every day from the new furnace.

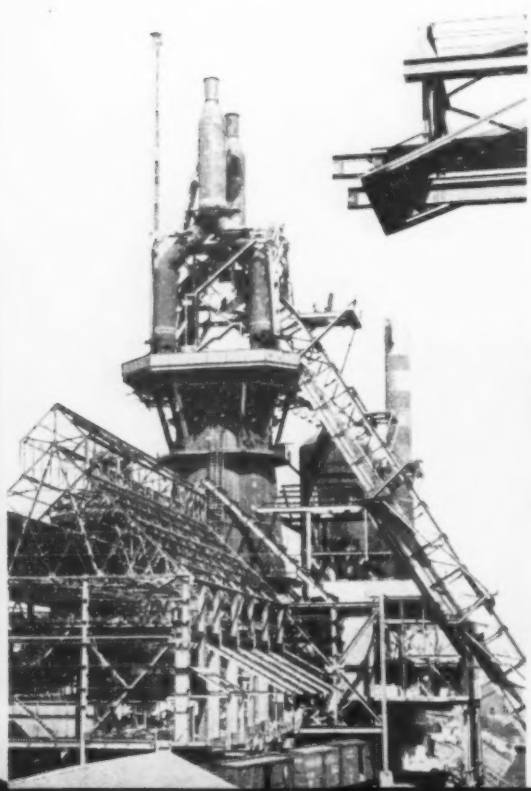
To help keep the wind turned on full, Youngstown is adding a third battery of coke ovens to its present two 120-stove groups. First coke should be ready for pushing in the next few days. Oven yield will be 755 to 1250 tons per day.

For shaping its new metal, the company is adding a blooming mill, should tighten the last bolt in May or June. Big output will be slabs, about 4800 tons per 24-hr period.

Cold Mill Coming—Another ingot-eater is on the drawing boards

HOT METAL: Will come from new No. 3 blast furnace (at left) at rate of about 1600 tons per day.

COKE OVENS: Part of the new coke plant with pusher at right below.



as a 56-in. cold mill. Land to sit it on has been bought, but ground has yet to be broken.

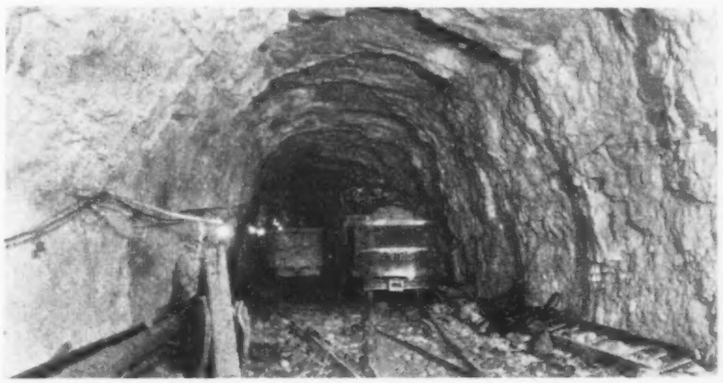
Two 30,000-ton ore boats are being built in Britain to bring raw materials to Indiana Harbor. Youngstown plans deliveries of beneficiated taconite from Canada in 1957. Deliveries in that year could run as high as 5.25 million tons. Present ore storage capacity at Youngstown is filling nicely, and company officials aren't worried over effects of the new furnace on ore stockpiles.

Plans for the Youngstown expansion were initially declared 2 years ago. Work began in July, 1950, on what had been a slag dump extending out into Lake Michigan. Original planning covered the 4 openhearths now in operation. Since that early date, 5 new openhearths have already been put into operation.

It takes steel to make steel. To give an idea of the raw materials needed for such an expansion:

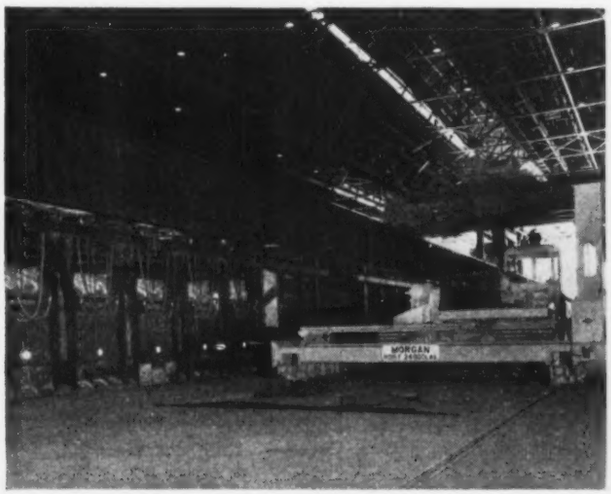
- 19,930 steel piles weighing 36,000 tons
- 200,000 cu yd of concrete
- 32 miles of track requiring 6000 tons of rail
- 60,000 tons of structural steel for building
- 4000 tons of sheets to be used in roofing and siding
- 8000 tons of steel for the blast furnace
- 3600 tons of steel used in the coke plant
- 5500 tons of pipe exclusive of pipe used in pilings
- 1700 tons of conduit
- 8000 tons of steel in cranes, ore bridges and unloaders
- 140,000 tons of rolled steel product
- 66,000 tons of refractory material

LAYOUT: Indiana Harbor plant as it looked during the summer. Part of tin mill is in foreground. Beyond it is coke plant. Above rails is steel plant with new openhearth shop in upper left. Foundations for other units are in upper center. Raw material storage yard is beyond new openhearths. Ore dock in upper right.



BORING: Solid rock being carved out for a 17-ft diam tunnel to carry water 3400 ft from Lake Michigan to center of the plant. Tunnel is 200 ft below the surface.

OPENHEARTHS: Charging floor of the new No. 2 openhearth shop is shown in left picture. Outside view of building housing the eight 250-ton openhearth furnaces is at right. Smaller building is for raw materials. A fraction of the 32 miles of new railroad track can also be seen.



FOR THE VERY BEST
See ATLAS
TRANSFERS - SCALE CARS
COAL CHARGERS - COKE QUENCHERS

COKE QUENCHING CAR

The latest Atlas Quenching Cars have longer life with lower maintenance than previous types. Their cost also is lower. This is due to the welded "corrosion-resisting" frame of heavier material with fewer joints and all joints weld-sealed together with the use of abrasion resisting floor plates which outwear cast plates and cost less to replace. There is no welding on Atlas abrasion resisting floor plates. An improved door operating mechanism is sealed against the entrance of coke dust and water and is simplified to eliminate the troublesome line shafts. Coke deflectors are provided at each end. Air hoses are armorclad. Gates generally are of steel bars arranged for easy replacement. Cars are supplied with or without upper coke racks.

ENGINEERS AND MANUFACTURERS
THE ATLAS CAR & MFG. CO.
1100 IVANHOE ROAD · CLEVELAND 10, OHIO

—Construction—

SELF-CERTIFICATION:

Industrial, "other" groups merged . . . Allow same self-certification.

National Production Authority said last week that it is removing the distinction between industrial and "all other" construction, lumping them together in one class so as to permit the same self-certification quantities for both.

This classification would then include virtually everything except residential, recreational and amusement, highways, and commercial construction.

It means this category may self-certify up to 5 tons of carbon steel (no more than 2 tons of which may be structurals), 1 ton of aluminum, and 0.5 tons of copper products.

After Apr. 30, under present schedule, these ceilings are to be raised to 25 tons of carbon and alloy steel, including up to 2.5 tons of alloy, 2.5 tons of copper and 2 tons of aluminum.

Among industry findings are:

Low Point — That the first 4 months of the year are low points in the industry anyway, and that the overall amounts under such self-authorization would normally be small while enabling some projects to continue if weather permitted.

Also, that while a tight structural situation still exists, it is found that most warehouses have adequate amounts of most types (except wide flange) to cover the estimated 4-month demand.

The industry was told, however, that NPA "must proceed with proper caution" but implied that some pull back of the effective date of the relaxation provision might be counted on some time after Jan. 1—providing the "materials situation permits."

Steel Inquiries and Awards

Fabricated steel inquiries this week include the following:

615 **Tons,** New Milford, Conn., bituminous concrete approaches and single square span curved truss bridge. E. S. Lawler, New Milford, Conn., district engineer.

465 **Tons,** Portland, Me., railroad bridges and new highway. W. H. Hinman, North Anson, Me., low bidder.

Reinforcing bar inquiries this week include the following:

1316 **Tons,** Portland and South Portland, Me., railroad bridges and highway. W. H. Hinman, Inc., Ellis C. Snodgrass, Inc., North Anson, Me., low bidder.

IRON ORE: Shippers Will Make It

Revised goal of 75 million tons shipped on the Lakes seems certain . . . Total through October was over 63 million tons . . . November weather is the only "if"—*By R. M. Lorz.*

They've done it—almost.

Great Lakes ore vessels are sailing into the home stretch of their race to beat the winter freeze and avert a possible iron ore shortage early next spring. Operators of the big carriers are confident of their ability to transport 75 million tons this season before adverse weather and pyramiding insurance costs force the fleet into shelter on or around Nov. 30.

The original goal of 90 to 95 million tons went out the window during the steel strike when shippers lost some 20 million tons. Meanwhile, so did requirements since relatively little ore was used during the 54-day strike.

But it wasn't that easy. For each ton of ore consumed during the shipping season at the very least a half ton of ore must be stockpiled for the winter. Simple arithmetic shows the fleet had to make up at least 7 million tons once shipping was resumed. Increased fleet capacity was an influential factor favoring a very heavy shipping rate.

Well Done—Shippers' performance has been encouraging to even the most pessimistic consumer. In both August and September, the big vessels moved record tonnages from the mines to dockside stockpiles. The fleet hauled 14,388,632 tons in September alone, bringing total tonnage as of Oct. 1 to 52,176,035. August total of 14,367,627 tons was the highest since August 1943 when 13,976,770 tons were shipped.

Decline in shipments did not start until mid-October, when unseasonable squalls and lowering temperatures abruptly halted all record breaking. An early taste of winter dropped shipments by 314,208 tons in the week ended Oct 20. The drop was inevitable since frozen ore had to be steamed; ship drafts were reduced and the usual jam-up at lake head occurred.

Still Short—There was a partial recovery in the week ended Oct. 27 when ore boats transported 2,961,116 tons to bring total tonnage for the year to 63,148,287 tons. That meant ore carriers were still 11,851,713 tons short of their announced goal.

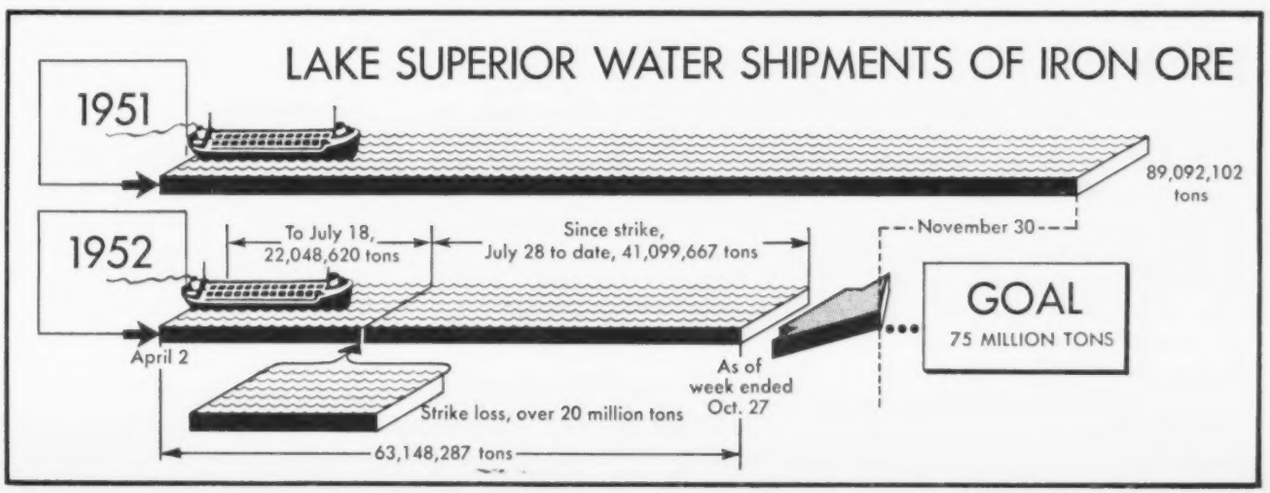
As the thermometer plunges, that looks like a large order, but carrier officials point out they are still running ahead of last year's shipping schedule on a weekly basis despite mid-October's slump.

Emergency all-rail shipments, launched by the steel companies when the strike ended last July, should also play a big role in eliminating an early spring ore famine, although some steel companies do not think it necessary to continue them through the winter.

Not Worried—U. S. Steel Corp., which produces about a third of the nation's steel, believes it has no cause to worry about its winter ore supply. At a press conference in New York last week, Ben Fairless, chairman, told reporters he confidently believed Apr. 1 would find his company with comfortable stocks still on hand at lower Lake points. He said his firm does not believe it will be necessary to make all-rail shipments this winter.

Eugene Grace, chairman of Bethlehem Steel, second largest producer, gave a similarly optimistic statement. Ore supplies of his firm also are in good shape, and no all-rail traffic seen.

Won't Break Records — One leading shipping official estimates all-rail movement will contribute between 3,500,000 and 4,000,000 tons of ore by the end of the year. That tonnage does not include all-rail shipment of 850,000 tons to mills in Duluth and Granite City. Total for all-rail shipment could be improved if the shortage of rail cars eased. But it couldn't top 1951's record of 7,918,798 tons.



CARNOTITE: Mining Colorado Plateau

Hundreds of small mines supply U. S. with uranium, vanadium . . . From a ton of yellow carnotite comes 5 lb of uranium, 35 lb vanadium concentrates . . . New mines opening.

As widely scattered over the 65,000-mile tableland known as the Colorado Plateau as seeds blown from a thistleball are the 200 and more mine pockets supplying the United States with uranium for bombs and vanadium to make steel tough for jet engines, tool steels, and castings.

A prime mover in this 4-state area of carnotite ore mining is U. S. Vanadium Co., subsidiary of Union Carbide & Carbon Corp. It told THE IRON AGE that from every ton of yellow carnotite drilled from small mines in sandstone slopes is extracted roughly 5 lb of uranium concentrates and 35 lb of vanadium. IRON AGE learned that new mines were opening up in South Dakota.

Second Largest — The Plateau has been built up in recent years to the second largest source of uranium in the world. Its area extends into Colorado, Utah, Arizona, New Mexico. About 5000 people labor in the processing mills and mines. More than $30 million is spent annually to mine and refine the carnotite.

A stretch of land known as the Uravan Mineral Belt is the axis of uranium-vanadium mining. Once vanadium was regarded as a nuisance in treating carnotite for uranium but now it is an important teammate. The largest deposit of vanadium ever discovered is near Rifle, Colo., site of a processing mill.

The quickening click of a Geiger counter indicates the presence of carnotite. Uranium emits gamma rays picked up by the Geiger counter or scintillometers. Mines are usually found on slopes above a rim of rock.

Test Cuttings—After a claim is staked out, diamond drill teams test cuttings. Pockets are pinpointed and evaluated. Private contractors move in if government teams find the mines commercially exploitable. Many miners sign contracts with U. S. Vanadium which treats the ore and produces the concentrates acceptable to the Atomic Energy Commission.

YIELD: From every ton of yellow carnotite is extracted roughly 5 lb of uranium concentrates (left) and 35 lb of vanadium.

MINING: Worker at top is in shaft cut to follow meandering carnotite vein.

Bulldozers blaze roadways up slopes so that trucks can make their way to mines. Miners store their ore in bins and trucks are on a constant safari collecting it for the treating plants.

The processing mill at Uravan, Colo., is now equipped with what U. S. Vanadium believes is the most efficient recovery process for high-lime uranium-vanadium ore. Trucks may bring their loads to Uravan or to seven other mills. New plants are under construction in New Mexico.

Trucks are weighed, then driven to ore bins where loads are dumped. Crushing and sampling equipment begin the treating process. Sampling is extensive because Washington pays from $1.50 to $3.50 per lb of uranium oxide in a ton of carnotite.

New Production Goals Set

Defense Production Administration this week said that steel castings capacity must be expanded to 3 million net tons by January 1954.

Several other expansion goals were established at the same time. These included expansion of 1.5 million net tons for blast furnace ferroalloys and 1,275,000 kw for electric furnace ferroalloys.

Target for steel castings represents a boost in capacity of 500,000 tons above capacity as of January 1950. For the blast furnace ferroalloys, the increase is about 400,000 net tons.

DPA said the latter increase can be met by diverting blast furnace units of 500-700 tons capacity to the manufacture of ferroalloys.

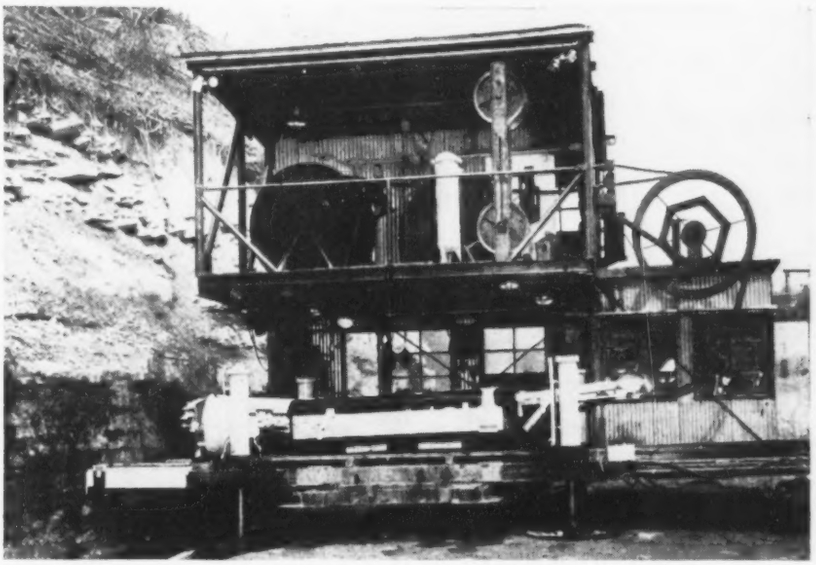
Rare Earths—At the same time, a target of 7000 tons capacity for production of rare earths was set. This represents an increase of 2400 tons capacity above 1950 supplies. It is already programmed.

Other capacity goals include 570 million lb for tetraethyl lead, an expansion of 150 million lb; an increase of 800,000 tons in metal can manufacture, to a total of 4.7 million tons; and, a target of 110,000 long tons of battery and chemical grades of manganese ore.

COAL: Mining by Push-Buttons

Remote-controlled continuous coal miner operates without men in the mines . . . Electrical nervous system keeps machine from leaving the coal seam—*By E. C. Kellogg.*

The most advanced continuous coal mining machine yet developed was made by a firm that isn't in the mining machinery business and doesn't care about coal as fuel. The men who designed it are quietly proud of the fact that they're chemical engineers and didn't know much about coal mining when they started.



Several years ago, Carbide & Carbon Chemical Co., a subsidiary of Union Carbide & Carbon Corp., made a study of underground gasification—a process of burning coal underground and piping out the resulting gases.

After digging holes and lighting fires inside the hills near Charleston, W. Va., Carbide decided the project was unwieldy, unprofitable and dropped it. But in the process of digging the holes needed to keep the underground fires going, Carbide developed an excellent continuous coal mining machine.

Remote Control — Though the carbide machine borrows features of units already on the market, it incorporates several unique improvements. It's the only continuous miner operated completely by remote control. No men have to go into the mine at any stage of the mining operation.

The machine with its wonderfully sensitive nervous system tells the operator when it strays from the coal vein. It also advises him on which buttons to push to get it back to pay dirt.

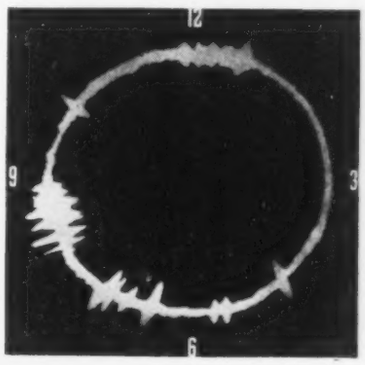
The conveyer system used to get coal out of the mine is an improvement over other methods.

Outcrops—The test model currently being used by Carbide was designed specifically for horizontal mining of outcrop seams. But company spokesmen told THE IRON AGE that conversion to vertical mining would not be too difficult.

Three men operate the miner. In one 24-hr period the machine gouged out 1200 tons of coal. This production per worker compares very favorably with other continuous miners.

Business end of the machine consists of four overlapping cutting heads equipped with tungsten carbide tipped cutting teeth. Whirling at full speed, the teeth can chew a 3 x 10-ft hole in a mountain at a rate of 1½ fpm while sending back a steady stream of 1 2/3 tons of coal per min. The coal is carried out of the mine to a truck loading hopper by a series of conveyer sections.

Feels Its Way—If the machine veers off the coal vein, sensitive feelers (stratoscopes) mounted on the outside cutters alert the operator in the control shack. The "stray" is registered on two oscilloscopes which resemble radar PPI scopes.



AT WORK: Coal mining rig at left has four hydraulic jacks raised to proper height for machine to begin. Above, typical oscilloscope pattern when making a normal cut. At 1 o'clock is a slight "blip" as tooth cuts first coal in roof. In shale between 11 and 12. It hits very hard bone coal between 8 and 9. Between 6 and 7 the deflection is by hard thin sections of coal. At 5, it enters space cut by adjacent head.

Any time the stratoscope teeth cut through anything other than coal, "blips" appear on the oscilloscope screen. Position of the "blip" indicates which way to direct the machine to get it back in the seam.

Depth of the holes that can be dug depends on the length of power cable and number of conveyer units that can be hooked up in sequence to carry out the coal. Now the machine is boring 750-ft holes, but the company expects to increase its range to 1000 ft very shortly.

In operation, the Carbide machine recovers about 65 pct of the

Use ARCOS Low Hydrogen Electrodes

ARCOS GRADE	A. W. S. SPEC.
Tensilend 70	E7016
Tensilend 100	E10016
Tensilend 120	E12015
Manganend 1M	E9015
Manganend 2M	E10015
Nickend 2	E8015
Chromend 1M	E8015
Chromend 2M	E9015

Because Arcos Low Hydrogen Electrodes eliminate or minimize preheat and postheat when welding high tensile steels, you can turn out more jobs in less time and with greater safety. Underbead cracking has never been known to occur with "properly designed" Low Hydrogen Electrodes.

As a pioneer in this field, Arcos has developed the most complete selection of Low Hydrogen Electrodes available today . . . all produced to Stainless quality standards. That's why you can expect consistently sound weld metal on every application. Whether defense or commercial, you know beforehand that Arcos Low Hydrogen Electrodes have already been "tested and proved" on jobs like yours. ARCOS CORPORATION, 1500 South 50th Street, Philadelphia 43, Pa.

WELD WITH ARCOS

Specialists in Stainless, Low Hydrogen and Non-Ferrous Electrodes

GEARS: Trouble Is

Manufacturers complain of NPA inventory curbs, steel supply, new Navy deck gear specs.

The gears that turn the nation's machines were hitting government monkey wrenches last week, but it appeared that gear manufacturers were taking the problem well in hand. Occasion was the annual meeting of the American Gear Manufacturers' Assn. at Chicago.

Number one problem was inventories. Like nearly every other phase of American metalworking, gear producers were fighting to hold their inventory of particular items within legal limits, were having difficulty doing so. Customers who cancelled orders, minimum mill orders that put the receiver over the legal 30-day inventory, were universal problems. In some

---

Push Button Mining

—Continued

coal in a given area—a good average for coal mining operations.

No Sale — Carbide hasn't even considered marketing the machine. At present they have no desire to go into the mining machinery business and have not yet started negotiations with any manufacturers.

IRON AGE was told, however, that the machine could be produced at a competitive price.

So far as the company is concerned the coal digger is still in the test stage. They are making no wild claims. But they feel they have a good thing and they're going to make it better. An improved model will be given a try-out next spring.

Means To An End — Carbide's main interest in the machine, however, is as a means of supplying low cost coal for its hydrogenation plant at Institute, W. Va. This is where the company conducts its main business of changing coal into valuable chemicals.

In Washington

materials their inventories were overloaded; in many critical items (and particularly large forging rounds) supplies were critically low.

Business Good — Steel supply generally was something less of a headache, however. The backlog of orders, which fell during the steel strike, has again risen. While a few concerns indicated a falling off, the general business picture looked good, and lack of steel was not forcing producers to the wall.

Navy's new deck gear specifications received a barrage. The proposed new procurement specs, affecting deck and steering gear for naval vessels (and a considerable number of gear manufacturers are holding government contracts), require tolerances to thousandths of an inch. Navy's announced intention was to prevent purchase of bad gears, a few of which had appeared recently. Industry's answer—the new specs were so high as to force a number of firms out of government work, and would overload the number of firms able to produce gears that would meet the new tolerances.

Bureau of Ships effected a slight retraction of its horns, has told gear producers to proceed under the old specifications until modifications on the proposed new specs can be established.

Brass Mill Copper Quotas Issued

National Production Authority has allocated brass mills and wire mills 56,667 tons of imported and domestic refined copper each for the month of November. Foundries and powder mills will get 5147 tons.

These allocations are at the same level as for October, says NPA, largely because of slippage in production and work stoppages.

On the other hand, allocations of copper scrap were reduced from October levels, from 83,050 tons to 74,453. Scrap allotments were: Brass mills, 39,200 tons; foundries, 10,052; all others, 25,228 tons.

Arcos Stainless Electrodes Pass "Quality Controls" For Your Protection

The label on every box of Arcos Stainless Electrodes is your assurance of uniformity from pound to pound and shipment to shipment. It tells at a glance that the electrodes you receive are "quality controlled" to deliver consistently sound welds on every job.

Starting with the rigid specifications that must be met by the raw materials, and following through with control tests all along the line, Arcos Stainless Electrodes must pass with flying colors before you receive them. That's your protection for the values that count . . . soundness, specific mechanical or corrosion resistant properties, or microstructures that can stand up to destructive service conditions. ARCOS CORPORATION, 1500 South 50th Street, Philadelphia 43, Pa.

WELD WITH ARCOS

Specialists in Stainless, Low Hydrogen and Non-Ferrous Electrodes

DIEMAKERS: Want More Apprentices

Lack of apprentices, skilled workers, worries over future main problems at tool, diemakers' annual convention . . . Not enough young men entering field to supply needs.

Shortages of apprentices, worries over future business and what to do about labor were three hotel corridor topics talked over at the National Tool & Die Makers Assn. convention at Rochester, N. Y., last week.

With tool and diemaking one of the important keystones of the defense program and the idea factory for an enlightened civilian economy, lack of skilled workmen was one of the drawbacks to full efficiency.

Some firms were having no apprenticeship troubles: But most were. A few "quiet" conversations blamed tool and diemakers themselves for the shortage but most people at the convention were decrying the lack of young people who would spend the time necessary to reach a skilled workman's status and pay.

Profit Sharing—Many individuals who got their start in large tool and die shops and are now owners of their business were wrestling with the problem of how to hold employees, increase their interest and production and yet forestall costly labor troubles. One idea gaining ground was the belief that small shops were coming sooner or later to profit sharing of some kind. That was too advanced for many shops but a few were toying with the idea.

As to future business prospects those with imagination believed that the entrance of the customer into his own would be a shot in the arm for the tool and die industry: even though defense would level off next year. Only with new products, cost-cutting tools and machines and an effort to serve the public with the latest in engineering instead of "warmed over" models could the tool industry get the lead out of the order taking period.

"HOW DOES BUSINESS LOOK?": Engrossed in trying to plot out future business trends are (left to right) Tom Campbell, editor of THE IRON AGE; R. H. Cope, NTDMA's outgoing president; Martin M. Rabold, president of Tool, Die & Special Machinery Assn.

Due For Overhaul—Sales policies of the steel industry must be completely overhauled before defense business seeks a lower level, Tom C. Campbell, editor of THE IRON AGE, told association members.

"Order-taking must be replaced by enthusiastic and positive selling practices," Mr. Campbell said. "Quality must be stressed more and more. Deliveries and service must be watchwords and the customer must be right—all the time."

Mr. Campbell added that tool and diemakers who produce the "master" tools enabling industry to mass-produce products are part of the answer to tomorrow's challenge. "These individualistic and highly imaginative workers—and there is a serious shortage of them—should be boon companions and sounding boards for the steel industry and its customers," he said.

Dr. Raymond Villers, of Rautenstrauch & Villers, New York, Industrial Manufacturing Consultants, and Professor of Industrial Engineering, spoke on effective managerial control in the small business.

Elected—Alfred Reinke, president of Gus Reinke Machinery & Tool Co., Hillside, N. J., was elected president of the association.

Other officers elected were Herbert C. Murrer, president of Murrer Tool Co., Inc., Cincinnati, first vice-president; Jerome H. Stanek, Stanek Tool and Manufacturing Co., Milwaukee, second vice-president; Joseph N. Huser, president of B & H Specialty Co., Inc., Indianapolis, secretary; and Philip R. Marsilius, vice-president of The Producto Machine Co., Bridgeport, Conn., treasurer.

Record Paychecks in September

Average earnings of America's 13 million factory workers rose in September to an all-time record high of $69.58 per week, reports Dept. of Labor. With a half hour lengthening of the workweek between mid-August and mid-September to 41.1 hr, weekly paychecks showed a gain of $1.78. The 41.1-hr workweek is the highest September level since 1944, according to preliminary estimates by the Bureau of Labor Statistics.

Although part of the over-the-month gain in hours was considered seasonal, most metalworking industries inspired by high steelmaking rates showed greater than usual increases.

STEEL: You Should Get Enough

Holbrook forecasts adequate supplies for civilian durables in first half '53 . . . Says CMP can be dropped on non-defense goods by Mar. 3 . . . Expects 1.5 million tons extra for quotas.

There will be no serious shortages of steel for civilian hard goods during first quarter 1953 and there will be ample supplies for the second.

So says Harry J. Holbrook as he ends a long tour of duty as the head of National Production Authority's Consumer Durables Goods Div.

He says this forecast is based on personal observation and talks with industry, rather than on surveys by NPA. Also, he believes CMP can be discarded for consumer durables as early as next March — 3 months earlier than the NPA-DPA timetable.

Bigger Quotas—Supporting this forecast was the announcement last week by NPA that a survey of steel mill order books indicated open space for certain products. This, the agency said, would probably make it possible to give out another 1.5 million tons in allocations for first quarter.

The automobile industry is expected to take a deep bite out of this windfall. It would like to get one-half or more of the total.

But the additional supply is expected to be mostly of the less critical kinds, such as sheet and strip, while automotive needs are seen as being largely for the types still short, such as bar and plate. This indicates that a substantial portion of the extra allotments would still be available for other types of civilian goods.

Maybe More — Officials report that NPA probably will begin writing tickets against the 1.5 million tons this week. Some of the more optimistic said that by the time this was completed a little more steel "might" be found available.

Also pointing to smoother sailing for manufacturers of consumer durables is an upward revision by NPA —by amendment of Dir. 18 to CMP Reg. 1—of the automatic allotment limits for procurement of controlled materials for the second and succeeding quarters.

Specifically, producers of "B" products will be allowed to calculate their allotments on a basis of 100 pct of the total carbon, alloy, and nickelbearing stainless allocated to them for the third quarter 1952.

Industry Controls This Week

Autos—Amend. 5, Rev. 1, CPR 1 requires manufacturers of new automobiles that are not a counterpart of any body style, line or series produced or sold on or after the base date to apply for ceiling price determination.

Government Agencies — Interp. 1, Rev. 1, GOR 2 prohibits government agencies, officials and employees from buying or selling at above ceiling.

Menders—Amend. M-26 permits unrestricted use of menders in the manufacture of packaging closures. Unmended members, unassorted temper tinplate, waste or waste waste may also be used without restrictions. SR 1, CPR 118 allows manufacturers of bolts, nuts and rivets who did not receive higher ceiling prices under CPR 118 to apply for ceiling increases.

Steel—Amend., M-6A requires steel distributors to certify that steel received from mills be used for warehouse purposes only.

Tools—Manufacturers and resellers of hand tools and components must calculate ceilings under CPR 30.

Tubular Goods—Dirs. 4 and 5, M-46A and Dirs. 6 and 7, M-46 prohibit operators from obtaining oil country goods made from imported semi-finished steel except through authorized controlled materials and also sets up procedures for trades of oil country goods and pipe.

Controlled Materials—Amend., Dir. 16, M-1 establishes Nov. 17-28 as the period in which fourth quarter non-military authorized controlled materials orders with February delivery dates must be placed to get on the delivery schedule in advance of first quarter orders.

Small Business Fights Back

A small business man has challenged Office of Price Stabilization to show cause why it should not grant price relief to cover increased labor costs as well as materials cost advances.

James M. Underwood, president of Vulcan Mold and Iron Co., Latrobe, Pa., has filed a formal protest with OPS, which claims it is unable to give the company any concessions to offset wage increases comparable with those granted by the steel industry—approximately 26¢ per hr.

Mr. Underwood contends his company's labor costs have risen approximately $1.50 per ton of product, yet all OPS will allow pricewise is relief for increase in cost of material used in production.

Must Answer—Protest was filed Oct. 29, and OPS must answer in 30 days. Then, if no relief has been granted, the company is free to take its case to the Emergency Court of Appeals in Washington, D. C.

"The ingot mold industry," says Mr. Underwood, "traditionally allied to steel, must follow in detail the wage pattern of steel industry. But when it comes to being accorded the same percentage price relief granted to steel and others since that time to partially offset that increase in labor cost, the same consideration is not evident.

"Some OPS officials have admitted that this does not seem fair, yet say their hands are tied by existing regulations. The action undertaken by our company in this instance simply attempts to gain equitable price treatment."

RENEGOTIATION: All Aren't Involved

Board finds few profits excessive . . . Only about half of all defense contracts subject to renegotiation . . . Number of companies involved small, but dollar volume high, sample shows.

Only about 50 pct of the 14,000 firms holding renegotiable defense contracts or subcontracts with the government in 1951 will be subjected to actual renegotiation procedures.

And the U. S. Renegotiation Board expects that detailed studies of the remaining 7000 contracts and subcontracts will reduce still further the number of firms which will eventually be called upon to return excessive profits to the U. S. Treasury.

Federal law requires all contractors and subcontractors having renegotiable defense contracts to file reports of their income with the Renegotiation Board at the end of their business years. But the law provides that those receiving $250,000 or less ($25,000 or less for brokers, agents, and dealers) will not be renegotiated.

Not Necessary — Samplings of reports already received by the board show that about 54 pct of all defense contractors and subcontractors received less than $250,000 from defense work for the first year under the renegotiation law. As a result they are not subject to formal renegotiation proceedings. Of the approximately 46 pct showing receipts above this amount, about half show profits which clearly cannot be considered excessive and therefore need not be renegotiated, Board Chairman John T. Koehler states.

STEEL: Finished Shipments Rise in August

American Iron and Steel Institute

STEEL PRODUCTS	CURRENT MONTH					TO DATE THIS YEAR				
	Carbon	Alloy	Stainless	Total	Pct of Total Shipments	Carbon	Alloy	Stainless	Total	Pct of Total Shipments
Ingots	67,375	21,387	659	89,421	1.4	428,999	165,494	11,449	605,942	1.5
Blooms, slabs, billets, tube rounds, sheet bars, etc.	184,834	50,959	1,108	216,902	3.4	1,012,853	318,769	10,773	1,342,395	3.3
Skelp	8,973			8,973	0.1	62,361			62,361	0.2
Wire rods	61,737	1,262	472	63,471	1.0	412,300	8,829	3,660	424,789	1.0
Structural shapes	418,089	9,487	8	427,584	6.8	2,463,309	38,566	45	2,501,920	6.2
Steel piling	25,779			25,779	0.4	*139,372			*139,372	0.3
Plates	647,131	30,961	2,151	680,243	10.8	4,162,310	215,311	16,261	4,393,882	10.8
Rails—standard	110,270	12		110,282	1.7	779,338	142		779,480	1.9
Rails—all other	11,002	3		11,005	0.2	72,799	51		72,850	0.2
Joint bars	10,737			10,737	0.2	67,510			67,510	0.2
Tie plates	37,604			37,604	0.6	225,580			225,580	0.6
Track spikes	11,380			11,380	0.2	59,286			59,286	0.1
Wheels	28,158	182		28,340	0.4	212,748	534		213,282	0.5
Axles	13,349	2		13,351	0.2	96,418	154		96,572	0.2
Bars—hot rolled	563,079	177,209	3,751	744,039	11.8	*3,587,702	1,188,901	28,122	*4,784,725	11.8
Bars—reinforcing	187,519			187,519	3.0	1,070,838			1,070,838	2.6
Bars—cold finished	125,585	28,585	3,901	158,142	2.5	929,739	200,906	29,760	1,160,405	2.9
Tool steel	1,541	8,104		9,645	0.1	13,787	68,342		82,129	0.2
Standard pipe	232,609	23	2	232,724	3.7	1,440,178	231	9	1,440,418	3.5
Oil country goods	134,757	16,235		150,992	2.4	865,787	85,393		951,180	2.3
Line pipe	217,852			217,852	3.4	1,767,712	119		1,767,831	4.3
Mechanical tubing	82,645	17,130	585	80,380	1.3	404,040	166,609	4,234	574,783	1.4
Pressure tubing	30,646	3,282	1,428	38,356	0.6	218,350	23,330	7,132	248,812	0.6
Wire—drawn	224,382	4,805	1,997	231,094	3.7	1,512,575	32,808	17,458	1,562,841	3.8
Wire—nails, staples	64,151			64,151	1.0	413,212		20	413,232	1.0
Wire—barbed, twisted	22,388			22,388	0.4	148,844			148,844	0.4
Wire—woven fence	30,393			30,393	0.5	223,978			223,978	0.6
Wire—bale ties	4,996			4,996	0.1	49,064			49,064	0.1
Blackplate	79,262			79,262	1.3	565,144			565,144	1.4
Tin & terneplate—hot dipped	176,452			176,452	2.8	828,113			828,113	2.0
Tin plate—electrolytic	302,263			302,263	4.8	1,746,716			1,746,716	4.3
Sheets—hot rolled	533,894	23,015	2,187	558,896	8.9	3,492,844	131,835	16,565	3,641,244	9.0
Sheets—cold rolled	738,563	8,210	7,237	754,010	11.9	4,556,989	48,671	61,938	4,667,578	11.5
Sheets—galvanized	177,701	†40		177,661	2.8	1,137,054			1,137,054	2.8
Sheets—other coated	18,820			18,820	0.3	129,956			129,956	0.3
Sheets—enameling	14,456			14,456	0.2	90,217			90,217	0.2
Electrical sheets, strip	6,552	37,023		43,575	0.7	47,654	305,137		352,791	0.9
Strip—hot rolled	151,505	3,299	115	154,909	2.4	1,028,144	18,242	2,204	1,048,590	2.6
Strip—cold rolled	113,339	2,290	11,483	127,112	2.0	931,812	12,982	79,957	1,024,731	2.5
TOTAL	5,831,748	443,385	36,965	6,312,118	100.0	37,393,592	3,011,236	289,587	40,694,415	100.0

During 1951 the companies included above represented 98.5 pct of the total output of finished rolled steel products as reported to the American Iron and Steel Institute.
* Revised. † Deduction.

Contracts Reported Last Week

Including description, quantity, dollar values, contractor and address. Italics indicate small business representatives.

Fin, M4A1, assy for 81 MM mortar shell, 246000 ea, $204,148, Madison-Kipp Corp., Madison, Wis.

Cartridge, ignition, M2, 2840900 ea, $281,249, Federal Cartridge Corp., Minneapolis.

Bomb, 2077890, $3,529,296, Keld Hold Mfg. Co., Lansing, Mich.

Cartridges, 11000, $26,400, Walter Kidde & Co., Inc., Belleville, N. J., *H. S. Klimaski.*

Mounts cal. .50 machine gun, 25, $326,465, Aircraft Armaments, Inc., Baltimore.

Signal Corps Supply Agency, Philadelphia.

Inspection kit, 300 ea, 627-32A-B, Nov. 14.
Ring set, piston, 13000 ea, 753-32D-B, Nov. 24.
Ring piston oil, 2000 ea, 758-32D-B, Nov. 24.
Switch rotary, 6300 ea, 805-32B-B, Nov. 24.
Cover amplifier silver pl, 6500 ea, 795-32D-B, Nov. 26.
Cover jack, 840 ea, 795-32D-B, Nov. 26.
Cover steel, 475 ea, 795-32D-B, Nov. 26.
Plate stop, 7500 ea, 795-32D-B, Nov. 26.
Mounting aluminum, 1600 ea, 795-32D-B, Nov. 26.
Bracket U shape steel, 5650 ea, 795-32D-B, Nov. 26.

Picatinny Arsenal, Dover, N. J.

Press, hydraulic, 75 ton, ea, 86B, Nov. 13.

Frankford Arsenal, Philadelphia.

Box switch, 350 ea, ORD-53-SP-66, Dec. 3.

Quartermaster Purchasing Div., Chicago.

Spare parts for refrigeration equipt, 4680 ea, 53-865B, Nov. 20.

Government Inviting Bids

Latest proposed Federal procurements, listed by item, quantity, invitation No. or proposal and opening date. (Invitations for Bid numbers are followed by "B," requests for proposals or quotations by "Q.")

Bureau of Ships, Washington.

Coupling and valve body assys, 250, 548-628Q, Nov. 10.
Receiving nipple assy, 325, 548-628Q, Nov. 10.

General Stores Supply Office, Philadelphia.

Scale spring balance, 475 ea, 2-1200B, Nov. 13.
Compasses, 2208 ea, 155-118084-53Q, Nov. 7.
Divider, 100 ea, 115-118084-53Q, Nov. 7.
Dividers, 7008 ea, 115-118084-53Q, Nov. 7.
Instrument drawing, 400 sets, 155-118084-53Q, Nov. 7.

U. S. Army Chemical Corps, Chicago.

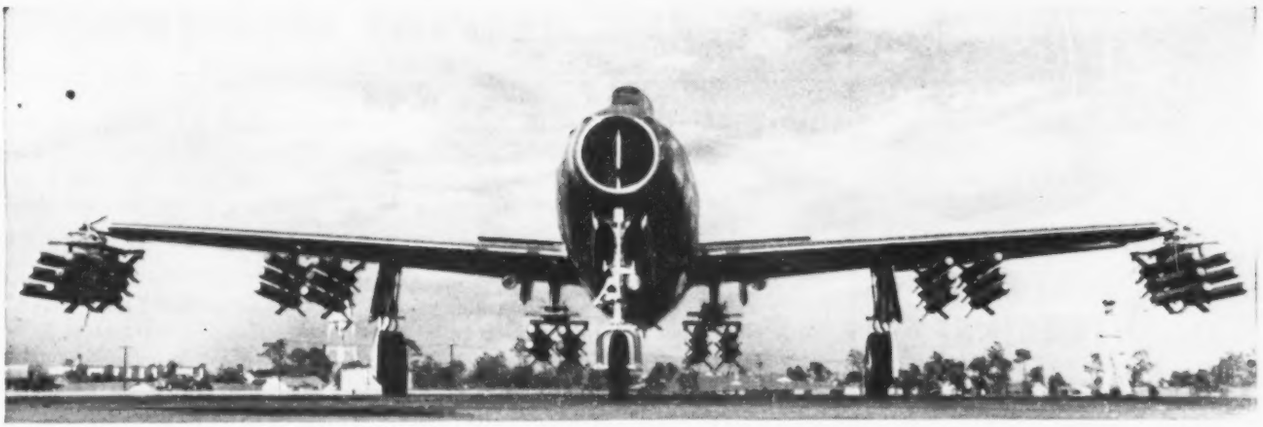
Inspection gages, var, 45 itm, CML-11-021-53-28, Nov. 20.

Rock Island Arsenal, Rock Island, Ill.

Machine link loading, 20000 ea, 11-070-53-188B, Nov. 14.

Yards & Docks Supply Office, Porthueneme, Cal.

Repair parts for Willys Overland Jeeps, 120 itm, 1319-53, Nov. 14.
Repair parts Ford Motor Automotive Equipt, 228 itm, 1036-53, Nov. 14.
Repair parts GMC Equipt, 182, 1049-53, Nov. 7.



Free-Machining ENDURO Flies with the Thunderjets

Parker AN fittings, manufactured of Type 316 ENDURO Stainless Steel by Parker Appliance Company, Cleveland, Ohio, fly with Republic Thunderjets and with many other aircraft.

Machined fittings for aircraft hydraulic control systems must, above all, be strong and tough. They must contain pressures as high as 3000 psi and possess high safety margins. They must fight off all attacks of corrosion and fatigue. They must resist the effects of sudden changes in temperature and atmospheric pressure.

The material to provide all these qualities, yet be economical to forge and to machine? It's ENDURO Stainless Steel, available in free-machining grades, either hot rolled or cold drawn bars.

ENDURO responds uniformly to forging—and, as these fittings indicate, is readily machinable.

ENDURO Cold Finished Bars are processed by Republic's Union Drawn Steel Division to provide close tolerances, accuracy of section, uniform soundness and fine surface finish. Two grades are approximately 90% as machinable as Bessemer screw stock.

To help you use ENDURO to cut costs and speed production of stainless steel bar parts, Republic offers you prompt, competent metallurgical assistance. Just write:

REPUBLIC STEEL CORPORATION
Alloy Steel Division • Massillon, Ohio
GENERAL OFFICES • CLEVELAND 1, OHIO
Export Department: Chrysler Building, New York 17, N. Y.

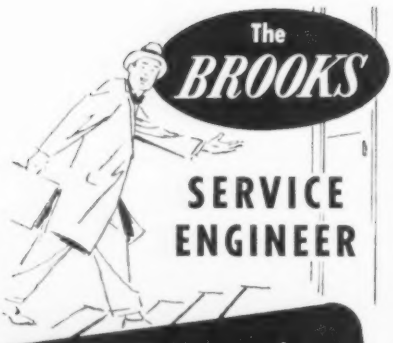
See and Hear
"THE STORY OF STAINLESS"

Full-color, 16 mm sound film—27 minutes running time. Dramatic . . . historic . . . interesting. Available to qualified groups without charge. Requires 16 mm sound projector. Send name of organization, type of projector, requested date to Ideal Pictures Corp., Dept. T-4, 65 E. So. Water St., Chicago 1, Ill., or write Republic Steel, Dept. K, Cleveland 1, O.

Republic. ENDURO® FREE-MACHINING STAINLESS STEEL

REPUBLIC STEEL

Other Republic Products include Carbon and Alloy Steels—Pipe, Sheets, Strip, Plates, Bars, Wire, Pig Iron, Bolts and Nuts, Tubing



will keep you up-to-date on the Advanced Ideas of

WATER TREATMENT SERVICE

In the United States and Canada there are upwards of half-million plants, institutions and buildings which require Water Treatment or Water Conditioning Services. Brooks services every type of water problem, and through these services has developed varied formulas and methods which sharply reduce operating and maintenance costs while improving efficiency. Brooks Service Engineers are available anytime, anywhere for consultation without obligation to advise how you can solve your particular water problems.

Write for This New Bulletin and Other Technical Data

. . Fuel Oil Treatments

Both our laboratory tests and field use prove that these formulas keep tanks and supply lines clean and moisture-free; eliminate carbon on injection nozzles and upper heads; keep exhaust ports open; and add months between overhauls.

BROOKS Chemicals, Incorporated

3304 East 87th St. Cleveland, Ohio
Plants at CLEVELAND, OHIO and HAMILTON, ONTARIO
Offices in Principal Industrial Cities

QUALITY SERVICE THROUGH SCIENTIFIC RESEARCH

Industrial Briefs

Congratulations — Charles R. Hook, board chairman, ARMCO STEEL CORP., Middletown, Ohio, celebrated his 50th year with Armco recently at a banquet given by more than 600 of his co-workers.

Incorporated—A & A Tool & Machine Works has been incorporated under the name of A & A MACHINE CO., Chicago.

Branch Office—THE LUNTZ IRON & STEEL CO., has opened a branch office in the Grant Bldg. in Pittsburgh with Jack D. Langer as manager.

Award Program—HELI-COIL CORP., Danbury, Conn., has announced the 1952 Heli-Coil Engineering Student Design Award Program. This award program is open to resident engineering undergraduate students registered in any school, college or university in the U. S. and Canada which offers a curriculum in any branch of engineering leading to a degree.

Elected—R. D. Wasserman, president, EUTECTIC WELDING ALLOYS CORP., Flushing, N. Y., has been unanimously elected to Young Presidents' Organization.

Acquired Stock—INTERNATIONAL HARVESTER CO., Chicago, has acquired the stock of The Frank G. Hough Co., Libertyville, Ill..

Appointed—DEVLIEG MICROBORE CO., Ferndale, Mich., has appointed the W. S. Gallagher Co., Inc., Buffalo, their exclusive representative in central and western New York State.

First Issue—LUKENS STEEL CO., Coatesville, Pa., has issued the first copy of Lukens News which they will publish once a month.

Newly Formed—THE DIE SUPPLY SALES CO. is a newly formed corporation which has taken over the sales and service responsibilities of The Die Supply Co. Address of the new corporation is 311 Vermont Ave., Dayton.

Hightest Honor—The leading metallurgical society of France, la Societe Francaise de Metallurgie, recently bestowed its highest honor on Dr. E. C. Bain, vice-president-Research & Technology, U. S. STEEL CO. He is the first American to receive the Grand Medal.

Leased Premises—WESTERN GRAVITY CASTING CO. has leased the premises formerly occupied by Rhodes-Lewis' Plant 3 in Los Angeles, at 1000 Exposition Blvd.

Named — PERLITE INSTITUTE, New York, has named Lewis Lloyd, president of Alatex Construction Service, Inc., of New Orleans, its new president.

Purchased Building—STRONGHOLD SCREW PRODUCTS, INC., has purchased a 1-story building located at 1801 W. Winnemac Ave., Chicago, which will double its present manufacturing facilities.

Order Received—WESTINGHOUSE ELECTRIC CORP. has received a $572,000 order from the Weirton Steel Co. for additions to an electrolytic tinning line which was installed in 1949.

New Facilities—THE DOBECKMUN CO., Cleveland, has obtained new storage facilities for the firm's "Metalam" Barrier Material in the Overland Terminal Warehouse, 1807 E. Olympic Blvd., Los Angeles.

New Plant—New North Haven branch plant of PRATT & WHITNEY AIRCRAFT will be formally dedicated Nov. 16. Following dedication ceremonies, an employees' Open House will be held.

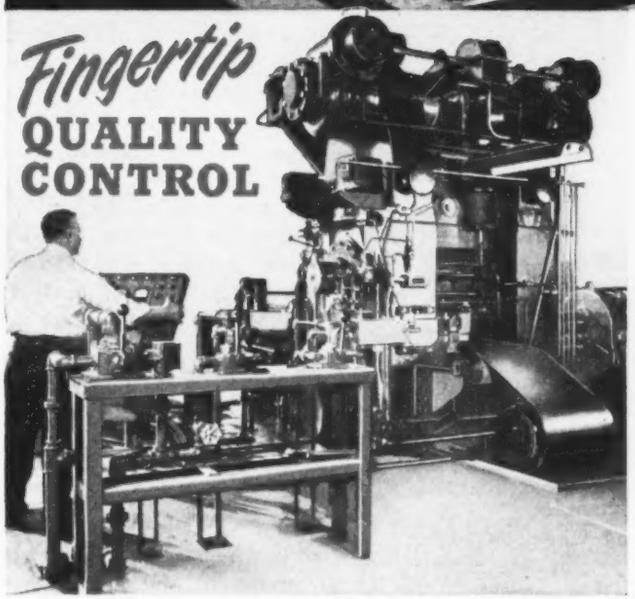
New Organization — THE METAL FABRICATORS' ASSN. has been established for the purpose of exchange of technical knowledge, keeping members abreast of new developments, ideas and equipment in metal fabricating, short cuts in production, etc.

New Address — RAVEN STEEL & TOOL CO. has changed its address to 525 Stagg St., Brooklyn, N. Y.

Plans New Plant—TENNEY ENGINEERING, INC., Newark, has completed its plans for a new 30,000-sq-ft plant to be constructed in Union, N. J. Plant architect is William E. Lehmann.

Expansion Program — The nation's supply of the new "middleweight champion" metal, titanium, is to get an extra boost as a result of expansion of facilities of REM-CRU-TITANIUM, INC., which will more than double the company's ingot capacity.

Complete Steel Service* from One Source



This completely modern plant with latest type equipment for *rolling* strip and processing sheet and strip steel is your ideal source for:

- *Warehouse stocks in sheets, plates, coils, cut lengths . . . All tempers and finishes.
- *Steel strip in coils and cut lengths . . . restricted tolerances, all tempers and finishes.
- *Roller leveling, pickling, annealing, shearing, slitting and skin rolling.

PRODUCTION STEEL STRIP CORPORATION supplements our regular warehouse service with custom steel at mill prices. This new, 4-high, reversing type cold strip mill with its modern, electronically operated *fingertip* quality control affords unusual flexibility in supplying steel strip to your exact specifications. Thickness .025 to .125 in all tempers and either bright or satin finish, can be processed to your exact width in coil or cut lengths.

PRODUCTION STEEL

WAREHOUSES:

PRODUCTION STEEL COMPANY
20001 Sherwood Ave., Detroit 34, Mich.
Phone: TWinbrook 3-5000

PRODUCTION STEEL STRIP CORP.
20001 Sherwood Ave., Detroit 34, Mich.
Phone: TWinbrook 3-5000

PRODUCTION STEEL COIL, INC.
20001 Sherwood Ave., Detroit 34, Mich.
Phone: TWinbrook 3-5000

PRODUCTION STEEL CO. OF ILLINOIS
2801 Roosevelt Rd., Broadview, Ill. (Chicago)
Phone: MAnsfield 6-4242

SENECA STEEL SERVICE, INC.
1050 Military Rd., Buffalo 17, N. Y.
Phone: Riverside 7920

SALES OFFICES:

PRODUCTION STEEL COMPANY
1002 E. 81st Street, Indianapolis, Ind.
Phone: Broadway 3468
E. W. Richardson, Sales Representative

PRODUCTION STEEL COMPANY
548 W. Mechanic Street, Jackson, Mich.
Phone: 2-9097
Glenn Christman, Sales Representative

PRODUCTION STEEL CO. OF ILLINOIS
5226 N. Bay Ridge Ave., Milwaukee, Wisc.
Phone: WOodruff 2-1206
H. Clive Morrison, Sales Representative

SENECA STEEL SERVICE, INC.
739 Westchester Ave., Rochester, N. Y.
Phone: Culver 7480
W. J. Knoll, Sales Representative

SENECA STEEL SERVICE, INC.
1347 Northcliffe Rd., Syracuse, N. Y.
Phone: 73-5722
Dean Hethington, Sales Representative

SENECA STEEL SERVICE, INC.
347 Price Street, Jamestown, N. Y.
Phone: 5759
S. N. Olmsted, Jr., Sales Representative

PRODUCTION STEEL COMPANY
1040 High View Lane, Green Bay, Wisc.
Phone: Howard 7407
Tony Canadeo, Sales Representative

Automakers Optimistic on Steel

Most companies plan all-out production for first months of '53 . . . Believe NPA will find a way to give out extra steel tickets . . . DTA needs trucks—*By R. D. Raddant.*

An optimistic feeling on first quarter steel prevails in the auto industry in spite of confused Washington statements on availability of tickets.

Most companies and divisions are going ahead on plans for nearly all-out production during the first months of 1953. This is in the face of last announced quotas which provided steel for 630,000 cars, then added an "equitable" share of 1,480,000 tons of additional steel. Present thinking in Washington is a 10 pct share for each civilian industry.

All this is still far below the 1,250,000-car goal that automakers want to turn out in what may be the hottest competitive period in many years. While automakers are not laying down ironclad production schedules equal to that amount, production plans are close to top figures.

Most top executives feel that when the first of the year rolls around, National Production Authority will come around to seeing things their way. As one division manager put it, "The NPA has to have time to count its cards before dealing them out."

Getting Serious — But as time goes by this counting of the tickets has its more serious side. Automakers must have a good idea of their steel supply in both amount and source before they determine production rates. They feel that a decision should be reached before too much time goes by.

One division manager who is inclined to be more soft-spoken than most made this statement:

"I don't like to be critical of the NPA people. They have to wait until the situation clarifies before handing out allotments. However, the time is coming when we will have to know so we can determine our schedules."

Few others would be that diplomatic.

Ask For More — NPA's Motor Vehicle Div. plans to put in a fast bid for more than the 200,000 tons it would get under the 10 pct rule of thumb. One source said the division would ask for between 600,000 and 700,000 tons—about one-half the total.

As the division sees it, this would amount to about 1 month's production at current levels. It would permit output of an additional 400,000 passenger cars and 125,000 to 150,000 trucks — for which aluminum and copper have already been allotted.

As justification for this claim, it will be cited that unless the steel is forthcoming, up to 15 pct of the automotive labor force will have to be laid off in February. This is admittedly an important point with the government.

Wants Trucks — Also, Defense Transport Administration holds that an output of 300,000 trucks is essential during first quarter (it had asked for 347,000 originally). Without additional steel, truckmakers say they will be lucky to turn out 150,000 units during the first quarter. With the moral support of DTA, truck manufacturers say they are going ahead at normal production rates in the hope of getting the extra steel.

However, one big obstacle—getting the proper types of steel—still stands in the way, even if Motor Vehicle Div. can persuade Defense Production Administration to grant preferential treatment to truck output.

Over the past 5 weeks, says NPA, mills have been producing steel at the rate of 115 million tons. But the open space is scattered and carries by geographic location and type.

What Kind—As it now looks, a large portion of the open space will center in lighter and less critical shapes and forms such as sheet, strip, small bars, etc.

This means that even if CMP tickets are issued for the 700,000 or so tons of steel, there is no assurance that they could be placed since the open space may not be found for the specific types needed.

As for other materials, NPA says that although one domestic and the Rhodesian mines have shut down, copper is still "in delicate balance." But it sees no reason at the moment why outstanding tickets should not be cashed.

And, the agency adds, aluminum now appears to be in "reasonable" supply for the first half 1953—in

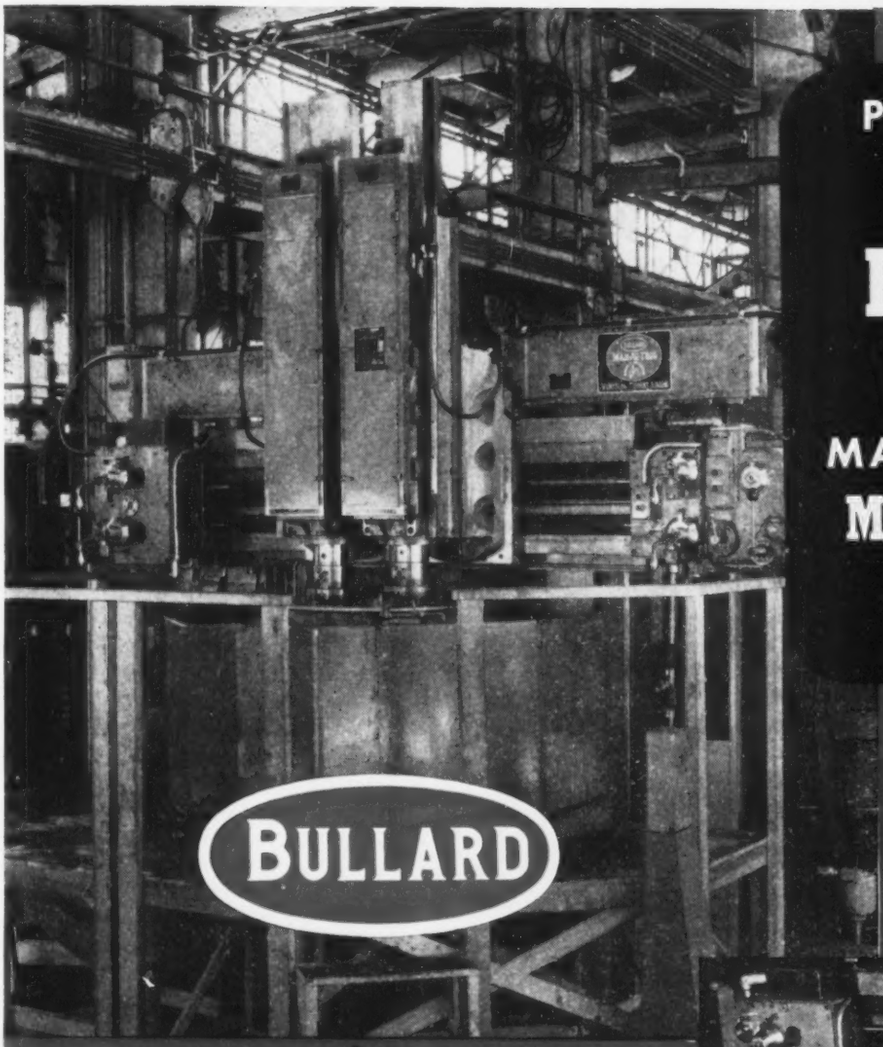
Automotive Production

(U. S. and Canada Combined)

WEEK ENDING	CARS	TRUCKS	TOTAL
Nov. 1, 1952	122,210*	30,479*	152,689*
Oct. 25, 1952	113,114	31,633	144,747
Oct. 25, 1951	93,576	25,167	118,743
Oct. 18, 1951	94,609	26,606	121,215

*Estimated

Source: *Ward's Reports*



PRECISION JET ENGINE WORK

MACHINED ON Man-Au-Trol VERTICAL TURRET LATHES

BULLARD

This particular Man-Au-Trol Vertical Turret Lathe was tooled for machining J47 jet engine compressor cases. However many other Man-Au-Trols are working on a variety of jet engine parts and numerous manufacturers not on defense work find these machines ideally suited to their production economy.

You too should investigate the possibilities and savings which these machines might afford on your work.

The job illustrated was orginally a problem jcb but was nicely solved by application of this method. The machine, work finish and times have proved more than satisfactory.

OPERATION DETAILS

ROUGHING

Rough bore I.D. with right ram.
Rough face and counterbore, turn O.D. with left ram.
Rough 5 large grooves with right ram.
Rough 7 small grooves with left ram.
Underface bottom and turn O.D. with right ram.

FINISHING

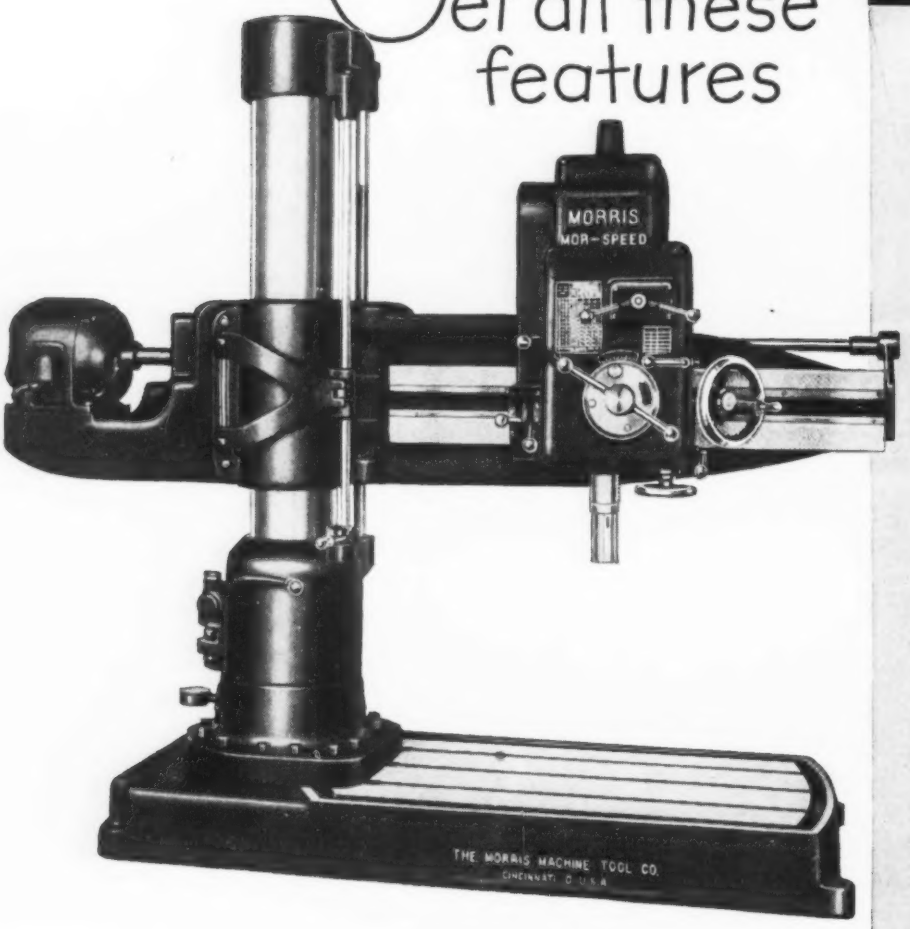
Finish bore I.D. with left ram.
Finish face and counterbore with right ram.
Finish 5 grooves with right ram.
Finish 7 grooves with left ram.
Finish underface bottom.

"Ask for Estimates on Your Work"

THE BULLARD COMPANY
BRIDGEPORT 2, CONNECTICUT

for production
or tooling
drilling
reaming
or tapping

Get all these features



CENTRALIZED CONTROLS

Every control in reach, easy to operate . . . saving operator effort and production time.

VARIETY OF SPEEDS AND FEEDS

A better job faster because the right combination is easily selected.

AUTOMATIC LUBRICATION

Built-in accuracy maintained and protected for years on end by positive lubrication.

GREATER RUGGEDNESS

Every part engineered for maximum strength and balance, assuring long, useful life.

MORE AUTOMATIC STOPS

Save time and reduce manual operations to an absolute minimum.

You'll find MORRIS Mor-Speed RADIAL DRILLS' accuracy and low cost production an important advantage in the fight against rising prices. Write for your copy of the latest Radial Drill Catalog tc day.

a better product at less cost —with precision PLUS *production*

Builders of MOR-SPEED Line

Morris

THE MORRIS MACHINE TOOL COMPANY, 935 HARRIET ST., CINCINNATI 3, OHIO

no event not less than the supply for last half 1952.

Tickets—As the end of the year approaches, some of the accepted truths about tickets are proving to be based on something else. For example, one independent revealed that only half of its fourth quarter tickets will be used this year.

The reason is that this particular company wants to start out with a rush and took pains to have the steel to do it, even at the price of sacrificing some 1952 production. Based on this one case, it may be that other tickets believed to be long gone may emerge later.

The belief in a strong market, plus the abundance of models with new engines and stylings, is forcing every automaker to be ready for a production sprint in '53.

Earnings Show Steel Strike Loss

Third quarter reports now being released show in cold dollars and cents the financial impact of the steel strike on the auto industry which actually suffered only the secondary effect of the 54-day siege.

Taking General Motors as an example, production curtailments resulted in third quarter sales dropping 18 pct from second quarter figures. Defense work helped.

Unit car and truck production slumped a full third during that 3-months period against the much smaller sales drop. Broken down into the two categories, third quarter civilian sales totaled $1348 million in 1952 against $1513 million a year ago. At the same time defense sales jumped from $209 million in 1951 to $347 million in the third quarter of this year.

Automakers Try Holding Prices

A hold-the-line price philosophy for 1953 is definitely shaping up in the auto industry.

The new model season is scarcely underway, but already two divisions of one of the Big Three and two independents have announced price schedules reflecting reductions or small increases in some lines offset by decreases in others.

SALES: Packard Tries New Approach

Splits its output into two separate lines . . . Will aim at both top, medium price markets . . . Hopes to recover reputation as quality leader . . . Dividing line at about $3000.

A new line of approach to the automotive market is being developed by Packard Motor Car Co.

Major point in the new program is the complete splitting of the Packard output into two distinct lines, the Packard and the Packard Clipper.

Packard's drop from a top position in the industry stemmed from its depression move of slipping into the medium priced class. In so doing, the firm lost some of the reputation that had made its name synonomous with top quality.

Regain Prestige — By splitting the output, Packard hopes to regain this reputation with its Packard while still biting off a large share of the medium market with the Clipper.

The dividing line will be at approximately $3000 with the Packard going as high as the quality market will carry it; into the seven passenger and limousine class if the market calls for it.

At the same time, Packard will go after a much larger portion of the entire market. Its 1952 output of about 65,000 cars may be boosted in 1953 to as high as 125,000 cars.

A big factor in production will be Packard's steel position, formerly a big stumbling block to output. A major plan of improving Packard's position with the mills is underway to obtain the necessary steel when controls are freed.

Meanwhile, the company has saved half of its fourth quarter tickets to give production a big boost in the early months of 1953 when the competition may be scrambling for tickets.

THE BULL OF THE WOODS By J. R. Williams

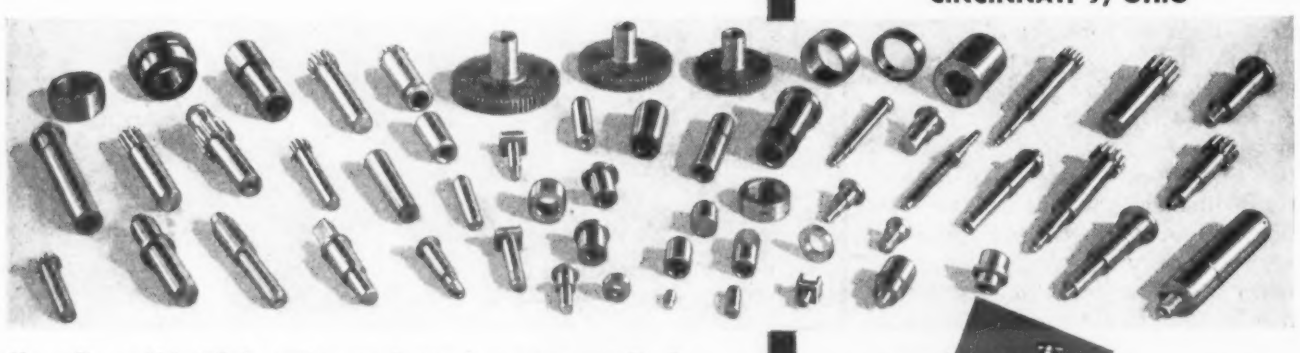
WHEN I SAY THAT, I'D BETTER KNOCK ON WOOD-- WOOD-- WOOD ?
THAT OLD GAG IS ON TH' WAY OUT--NOT ONLY IN A SHOP BUT--
MY NEW HOUSE IS NOTHIN' BUT CHICKEN WIRE, TAR PAPER, PLASTER, GLASS, GLUE, AN' GLAMOUR!
WELL, WHITTLIN' HAD TO GO CUZ PLASTICS ARE TOO BRITTLE TO WHITTLE! WHAT'S WOOD, THEY'LL BE ASKIN'!
THE NEW GOLD
T. M. Reg. U. S. Pat. Off. Copr. 1952 by NEA Service, Inc.
11-7 J.R.WILLIAMS

You can economically grind small quantities on the CINCINNATI FILMATIC CENTERLESS

Close-up of a CINCINNATI No. 2 Centerless Grinder set up for a typical infeed job. The Hydraulic Profile Truing equipment over the regulating wheel is especially desirable on machines used for small lot production.

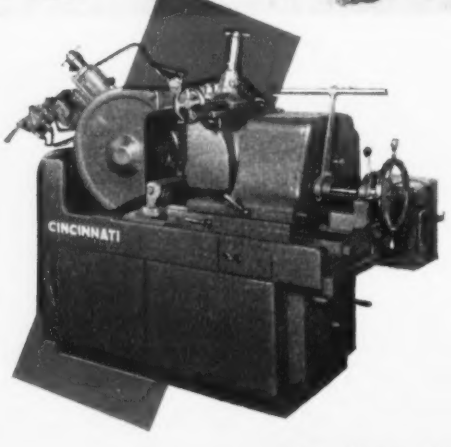
Are you acquainted with the possibilities of grinding small quantities on a CINCINNATI FILMATIC Centerless Grinding Machine? For lowest cost production, do these two things: 1) Group together all parts requiring a particular type of setup. You will eliminate frequent changes from thrufeed to infeed jobs. 2) Group all parts together by diameter. It takes less time to change the setup for a small difference in diameter than a large difference. ¶ It will certainly be to your advantage to investigate the CINCINNATI Centerless for grinding a wide range of parts. A more complete story of economical small parts production may be obtained by writing for "Principles of Centerless Grinding," publication No. G-503-2.

CINCINNATI GRINDERS INCORPORATED
CINCINNATI 9, OHIO



Above: These widely differing parts were all ground on a CINCINNATI No. 2 Centerless Grinder. Average quantities range from 25 to 500 pieces.

CINCINNATI No. 2 Centerless Grinder. Catalog No. G-611 contains complete specifications. Copy sent on request.



CINCINNATI

CENTERTYPE GRINDING MACHINES • CENTERLESS GRINDING MACHINES
CENTERLESS LAPPING MACHINES • MICRO-CENTRIC GRINDING MACHINES

Election Lull's Over for Bureau Chiefs

They must start planning for new Congress, present politically realistic projects . . . How about standby controls? . . . Clear way for joint St. Lawrence River power—*By G. H. Baker.*

Now that the political die is cast, top-level Washington bureau heads settled down this week to the business of translating the electorate's general endorsements into modifications or extensions of present programs or specific federal projects to be carried out in months ahead.

Snail's pace of bureaucratic activity during the past 60 stormy election days has ended. Government officials once again dare to plan ahead. Their immediate task is to draft a workable, politically realistic plan of action for the White House and the new Congress by Jan. 1, 1953.

What to Ask?—Bureau heads were wondering how much they could ask for in the way of controls programs. What would be the "case" for government-built plants and would Congress go along with this program? How about plans to stockpile critical machine tools and machinery?

Nearly all the top-drawer planners privately admit that the worst of inflation has past. But a new international crisis could be the impetus for a fresh burst of rising prices and wages.

Standby Controls — There is wide agreement among bureau chiefs that the very minimum regulatory program to be sought of the new Congress is a standby program of controls. "It's good fire protection," they argue. "You hope you never need to use your fire extinguisher, but you're glad you've got one when you need it."

This, in essence, is the foundation of the over-all program now being readied: A skeleton "stabilization" agency which is to prepare wage and price regulations for use "when needed."

St. Lawrence Power—One of the big preliminary hurdles in the road leading toward joint U. S.-Canadian development of the St. Lawrence River had been cleared this week.

International Joint Commission on Boundaries' approval of scheduled development by both the U. S. and Canada of St. Lawrence hydroelectric power project means that either Congress or the Federal Power Commission can now declare the U. S. an official partner in construction.

The Ontario Hydroelectric Commission intends to develop the Canadian part of the project.

Federal Power Commission now has the green light to act on an application of the New York State Power Authority for federal permission to develop the U. S. portions of the project.

"I realize this is top secret work, Mr. Switzel. But you've got to start trusting me sometime."

Remove Gut Dam — Under the joint U. S.-Canadian agreement, the project is to be located in the international rapids section of the St. Lawrence River. This will mean removal of Gut Dam, located below Ogdensburg, N. Y., and near Cardinal, Ontario. Arrangements for removal already have been made, government sources report.

Joint power project is estimated to cost $400 million, with both countries sharing the cost equally. Output of power, estimated at 13 million kw annually, also is to be divided equally.

Only the Best—Main reason for the U. S. Air Force decision to buy an unnamed quantity of F-100 jet fighters is the now-proven battlefield superiority of this type of combat fighter over the F-86—up to now the best operational fighter employed in mass in Korea.

Contract for the F-100 fighters has been placed with North American Aviation, Inc., Los Angeles.

"More Lethal Blow"—The F-86 has a listed speed of 650 mph and a service ceiling of more than 45,000 ft. Air Force officials decline to comment on the capabilities of the new F-100 model, but say it is "designed to strike a more lethal blow in aerial combat at speeds faster than sound."

Air Force also has placed an order for initial production of the F-102 Delta Wing Interceptor. This ship also is listed in the supersonic category. The F-102s are to be built at San Diego by Consolidated-Vultee.

Market Study—Commerce Secretary Charles Sawyer and a 6-man party were scheduled to arrive overseas this week for a month-long study of European nations as prospective buyers and sellers.

In the party were two American businessmen — Chairman Charles R. Hook, of Armco Steel Corp., and President Langbourne M. Williams, of Freeport Sulfur Co.

GO "AMERICAN" FOR CIRCULAR WELDED PRODUCTS

Welding is our business. Let us put our 34 years of experience to work for you.

Complete designing, engineering and metallurgical service is available where fusion or resistance welding of either ferrous or non-ferrous metals is required.

A company you'll like to deal with

THE AW AMERICAN WELDING & MANUFACTURING CO. · WARREN, OHIO

Send for your copy of our 20 page illustrated catalog

LET US SEND YOU MORE FACTS OR BETTER YET SEND US YOUR SPECIFICATIONS FOR PROMPT QUOTATIONS

ALUMINUM: Britain Fills The Gap

New three-way agreement allows Canada to ship 22,000 tons more white metal . . . Repayment of earlier loan from Britain postponed . . . Hydro-power shortages cost 25,000 tons so far.

Aluminum supplies in the first half of 1953 will be 38,500 tons greater than expected as a result of a new agreement between this country, Canada and Great Britain.

Specifically, Aluminum Co. of Canada will divert to the U. S. during December and first quarter 1953 some 22,000 tons which would have gone to Britain. The balance of 16,500 tons was to have been sent to Britain early in the new year to repay an earlier loan. This repayment date has now been extended.

Deal was worked out when power shortages threatened to cut domestic aluminum output to dangerously low levels. The agreement, said Deputy Defense Production Administrator Sam Anderson, "will assist in avoiding accumulation of a large backlog of unfilled orders."

Not Made—Actual loss over the past 2 months totals over 25,000 tons as a result of low-water-caused power shortages. Currently the loss is approximately 3800 tons a week and it may increase on Nov. 17 if Defense Electric Power Administration cuts off any more power in the Northwest. If the weather continues dry, these production losses may reach into next March.

Defense Production Administration is quick to point out that this extra supply does not mean additional first quarter allocations. Rather, it represents insurance that allocations can be continued —and met—at current levels.

Metal involved will be in addition to aluminum already allotted for the U. S. by Alcan. Thus, Mr. Anderson said, this country can count on Canadian shipments of 40,000 tons during the fourth quarter, plus domestic production of 42,500 tons in first quarter of '53.

In addition to helping avert a possibly serious shortage, the agreement will help support the aluminum market when defense needs begin to slack off and new production comes in.

Repayment — Under an earlier loan, Britain had permitted diversion of 27,500 tons from Alcan to the U. S. To this is added the current diversion of 22,000 tons to bring the total owed to 49,500 tons.

Under the revised schedule for return of the metal, some 11,000 tons is to be set aside for shipment to Britain during second quarter 1953.

Remainder of the repayment is to be spread out over last half 1953, 1954, and into 1955 if necessary. The agreement, however, permits Britain to demand a stepped-up repayment rate should it run short after first half 1953.

Expansion Goals — In another action to boost U. S. aluminum supplies, DPA last week announced expansion goals for aluminum sheet and sheet and plate heat treating facilities.

First phase calls for additional annual aluminum sheet capacity of 342,000 tons by Jan. 1, 1955. This will boost sheet plate and foil capacity from the 1950 figure of 954,000 tons to 1,296,000 tons.

Second part of the goal will provide extra annual aluminum sheet and plate heat treating capacity of 423,000 tons. This will raise capacity from 351,000 tons in 1950 to 774,000 tons in 1955.

Government assistance under this goal, DPA said, will be restricted to these facilities:

(1) Those capable of producing sheet and plate 48 in. or wider;

(2) Sheet and plate mills which include heat treating facilities capable of processing a minimum of 50 pct of finished capacity; and

(3) Sheet and plate mills so designed that heat treating capacity to process the total finished production capacity can be installed with a minimum of difficulty, expense or disruption to existing production.

This goal does not include additional capacity for foil.

Northwest Hydro-Power Use Curb

Effect of the water shortage on the production of electric power in the Pacific Northwest now will be felt more sharply, with the issuance of an order limiting new contracts and rationing power to firm customers.

Defense Electric Power Administration has issued Order EO-5—which directs interruptible contracts to be cut off, limits delivery to any new customer using more than 50,000 kwh per week, and rations firm users to 90 pct of the amount in use a year ago.

In addition, DEPA has drawn up, ready for emergency use, another order which would impose further strict limitations upon general use throughout the entire Northwest area.

This order, however, will not be issued unless water and weather conditions grow worse or some other emergency develops.

Since August, DMPA says, the utilities themselves have voluntarily turned down new customers except on a basis of an interruptible contract. For this reason, only the present moderate order has been necessary so far to support officially industry action.

How to shackle this steel production thief

EXCESSIVE down-time in open hearth steel furnaces—a costly thief of steel production—can be shackled by Permanente 165 *periclase* ramming mix.

Patented Permanente 165 bonds itself to *full depth* by means of crystal-bridging. A ceramic bond begins forming at temperatures as low as 1500°F. Thus a deeper bond is obtained at normal burn-in temperatures—with no formation of fluids.

Permanente 165 *retains higher refractoriness* during long campaigns. Accurately-sized, preshrunk sea water magnesia periclase grains insure *high density*.

As a result, Permanente 165 gives you a dense, highly refractory bottom of high hot load strength that minimizes breakthroughs. And down-time for repairs between heats is cut to a minimum. This means increased production time, increased tonnage per year.

YOUR Kaiser refractory engineer will give prompt attention to your refractory problem—will offer, where desired, research, design and installation service to give you maximum production most economically. Write for descriptive literature on Permanente 165 and on the companion ramming mix, Permanente 84. Principal sales offices: *Chemical Division*, Kaiser Aluminum & Chemical Sales, Inc., 1924 Broadway, Oakland 12, California. First National Tower, Akron 8, Ohio.

Kaiser Chemicals

Pioneers in Modern Basic Refractories

Basic Refractory Brick and Ramming Materials • Dolomite • Magnesia • Magnesite • Alumina • Periclase

Juice Shortage Hits Northwest

Worst power shortage in area's history hits industry, aluminum output . . . Firm power loads cut for first time . . . Will lose 2500 tons aluminum output monthly—*By T. M. Rohan.*

The worst power shortage in Pacific Northwest history is tightening its grip on industry there, taking a body blow at badly needed aluminum production and extending its grasp to over 1000 industrial firms.

Although the Northwest power shortage has come to be an annual pitfall, Hershel Jones, Bonneville Power's chief load estimator, told THE IRON AGE this is the first time the "firm" power load has been reduced.

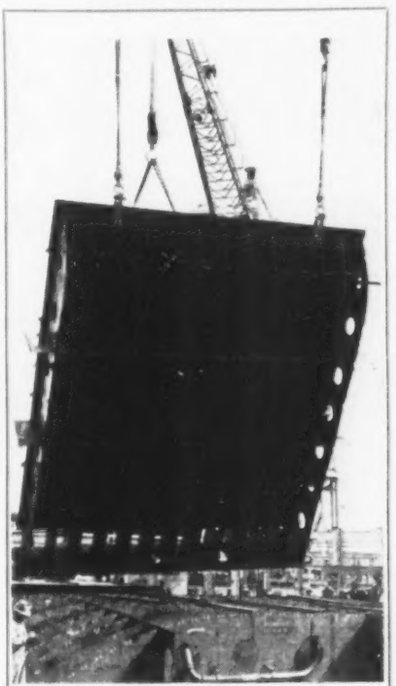
Defense Electric Power Administration in Washington last week ordered firm power load users who consumed more than 8000 kwh power per week cut to 90 pct of their regular supply effective Nov. 17. Thus Alcoa, Reynolds and Kaiser will lose a total of 2500 tons per month including the "interruptible" supply cut off 2 weeks ago. There were hints of another 10 pct cut Dec. 1.

Cancelled—Reynolds, at Longview, Wash., had hastily signed up the Cowlitz (Wash.) County Public Utility District for 20,000 kw steam power. Contract (which would have expired in 3 days anyway) was cancelled by DEPA and the power fed into the Northwest pool. About 30 workers will be idled and one of three potlines cut off. Kaiser had three lines at Mead, Wash., down and Alcoa expects to lose 750 tons monthly between Vancouver and Wenatchee, Wash., plants.

Mr. Jones said that present water levels are the lowest since 1936-1937. Hydro-power plus all available steam plant generation (including a 10,000-kw railroad-car-mounted Navy unit started this week) still will be 200,000 kw short until Apr. 15 barring torrential rains.

NPA Version—In Pebble Beach, Calif., T. A. Lynch, National Production Authority's Aluminum Div. director, told 60 convening National Assn. of Aluminum Distributors that the U. S. deal for 77 million lb of aluminum from Aluminum Co. of Canada should tide them over through the second quarter.

To the distributors, most of whom are oversold up to 25 pct, Mr. Lynch said NPA estimates and allocations are inflated because of the Pacific Northwest and Tennessee Valley power shortages and the steel strike which delayed expansion.



GOING UP: Up and over goes a 44-ton inner bottom assembly unit at Bethlehem Pacific Coast Steel Corp.'s San Francisco Shipyard. Assembly will be installed on the first of five Mariner-type freighters now being built at the yard. It is assembled upside down with all floors and girders complete and piping and heating coils installed.

Although most major producers are somewhat resentful over inroads of foreign aluminum, distributors who have lived in a sellers' market since 1946 were relieved at the news. The convention's two major speakers, David T. Reynolds of Reynolds Aluminum and S. S. Inch of Kaiser both were optimistic on post-defense markets.

Their meeting was the second for the 68 franchised distributors in the year and a half old organization.

Billions for Bombers—Boeing Airplane's Vice-President Wellwood E. Beall told visiting newshawks in Seattle last week the government is putting $10 billion into the B-47 and B-52 plans—believed to be the largest amount ever spent for a single combat unit. Actually the figure is padded somewhat to include airport runway extensions, government tooling and production facilities.

Boeing's current expansion in the program will hit $58 million, two-thirds of it government money for new engineering and production facilities at Seattle. Plants in on the program are Boeing at Seattle and Wichita, Douglas at Tulsa and Lockheed at Marietta, Ga.

Better—Two B-52s have been built by Boeing and Mr. Beall declared they outperformed the B-47, now in production at one-a-day, "in every respect."

Next step for Boeing is development of jet tanker planes to accompany bombers on entire runs eliminating the time and fuel-consuming rendezvous. Also in the works is a 600 mph-plus, 80-to-120-passenger jet commercial transport for 1954 delivery.

If you're using high-priced quenching oils

YOU'RE PROBABLY WASTING MONEY!

Verified reports from a great many heat-treating plants prove conclusively that they have saved money by switching from an expensive quenching oil to a Sun Quenching Oil. In every instance these plants have maintained—or surpassed—their standards of quality through the use of Sun's specially refined naphthenic quenching oils.

These are facts—not idle boasts. If you would like to see field reports giving the details of these plants' quenching operations, and the benefits they obtain, fill in the coupon below.

Sun Quenching Oils can handle 95 percent of all quenching jobs

Dept. IA-11

SUN OIL COMPANY, Phila. 3, Pa.

Perhaps I *am* paying too much for quenching oil. ☐ I'd like a Sun Representative to show me field reports of other companies' experience with Sun Quenching Oils. ☐ Please send me the informative booklet "Sun Quenching Oils."

Name_____

Title_____

Company_____

Address_____

City_____ Zone_____ State_____

1 They cost less. You save on the purchase price.

2 They have low drag-out. When heated they thin out more than paraffinic oils, draining off parts more rapidly. You reduce your operating costs.

3 They keep systems clean. Because of their natural detergency, the tank and system stay clean. Coolers keep operating at peak efficiency.

4 They have long life. Sun Quenching Oils do not thicken up in service, and under normal operating conditions, they need never be replaced.

5 They assure a uniform rate of cooling. These oils have excellent metal-wetting characteristics. They do not lose quenching speed after extended use.

SUN INDUSTRIAL PRODUCTS

SUN OIL COMPANY, PHILADELPHIA 3, PA. • SUN OIL COMPANY, LTD., TORONTO AND MONTREAL

SUNOCO®

Non-rated Orders Ballast Demand

Slight drop shown in new order index but no indication of serious decline . . . Shipments hit year's high as manufacturers make up vacation delays—*By E. C. Beaudet.*

New orders for machine tools dropped slightly in September, according to preliminary estimates of the National Machine Tool Builders' Assn., but were not sufficient to indicate any serious decline in market demand. New order index for last month came to 300.3 as compared with 309.1 for August.

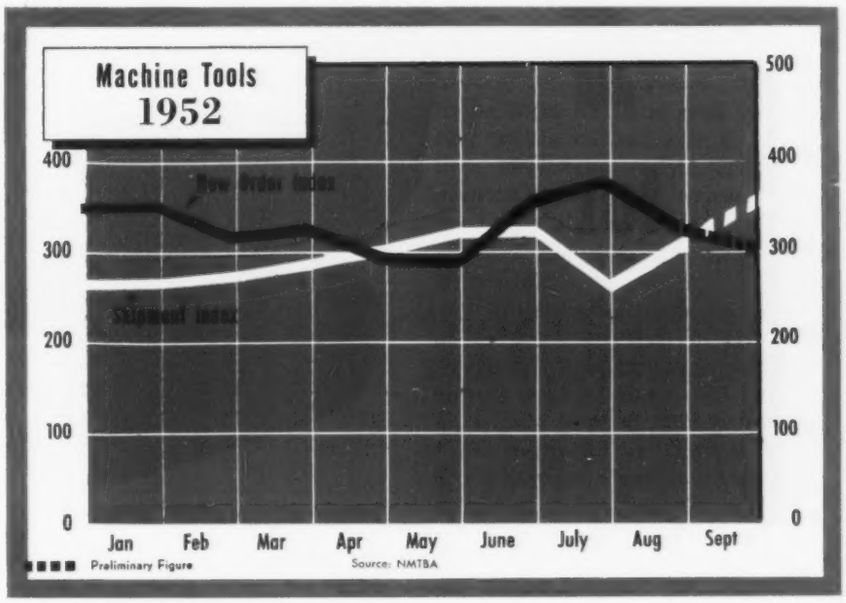
Industry sources say orders are holding up fairly well and are coming in at a better rate than anticipated. The fact that new orders are remaining on a more or less constant level is attributed mostly to the ability of builders to ship nonrated orders.

The volume of defense business continues to decline and some cancellations are still being made. However, defense orders are expected to be given a boost when several programs, now pending in Washington, are completed.

Shipments Mount — Shipments, meanwhile, continue to climb. The index for September rose to 366.8, the highest so far this year. This reflects the catch-up on shipments delayed by vacations during July and August. A good number of machines almost totally completed were held up during vacation periods and not shipped until last month.

Cancellation of defense contracts by manufacturers is causing some builders headaches in receiving payment for machines ordered when the contracts were in force. In some cases, tools were already completed and shipped when the contracts were terminated. In others, the orders were so near completion that they had to be finished.

Since the manufacturers had no further need for the equipment the tools were reassigned by the services involved to other defense manufacturers. This meant that the builder had to wait until a new buyer was found and the machine shipped and accepted before payment was made. In some cases, other manufacturers were assigned tools they were unable to use in making the parts their contracts called for.



Foreign Flood—Imports of machine tools have been building up at an alarming rate (see p. 105), while exports of American tools are on the downgrade. European tools are being bought in this country at the rate of $50 million per year. Meanwhile, our exports have dropped from an average of 25 pct of total domestic production to 6.9 pct for the first 9 months of 1952.

Seriousness of this situation was illustrated last week by Tell Berna, speaking at the American Institute of Electrical Engineers' special conference on machine tools in Albany. He pointed out that European buyers are still prejudiced in favor of American machine tools.

However, there are many factors working against the sale of American machine tools in Europe. To overcome them, he said, we will have to design equipment so superior that Europeans will have to buy from the U. S.

Bad Position—American builders have many obstacles to overcome not shared by foreign competitors. Foreign builders don't have to conform to regulations. They can sell to U. S. anytime, with no priority restrictions.

The effect of this double squeeze, loss of exports and greater imports, may result in a reduction of machine tool capacity in this country. So far, the machine tools being imported by the U. S. are mostly standard general purpose machines. Thus the brunt of this impact will be concentrated on a certain segment of our industry and will be sorely felt by them.

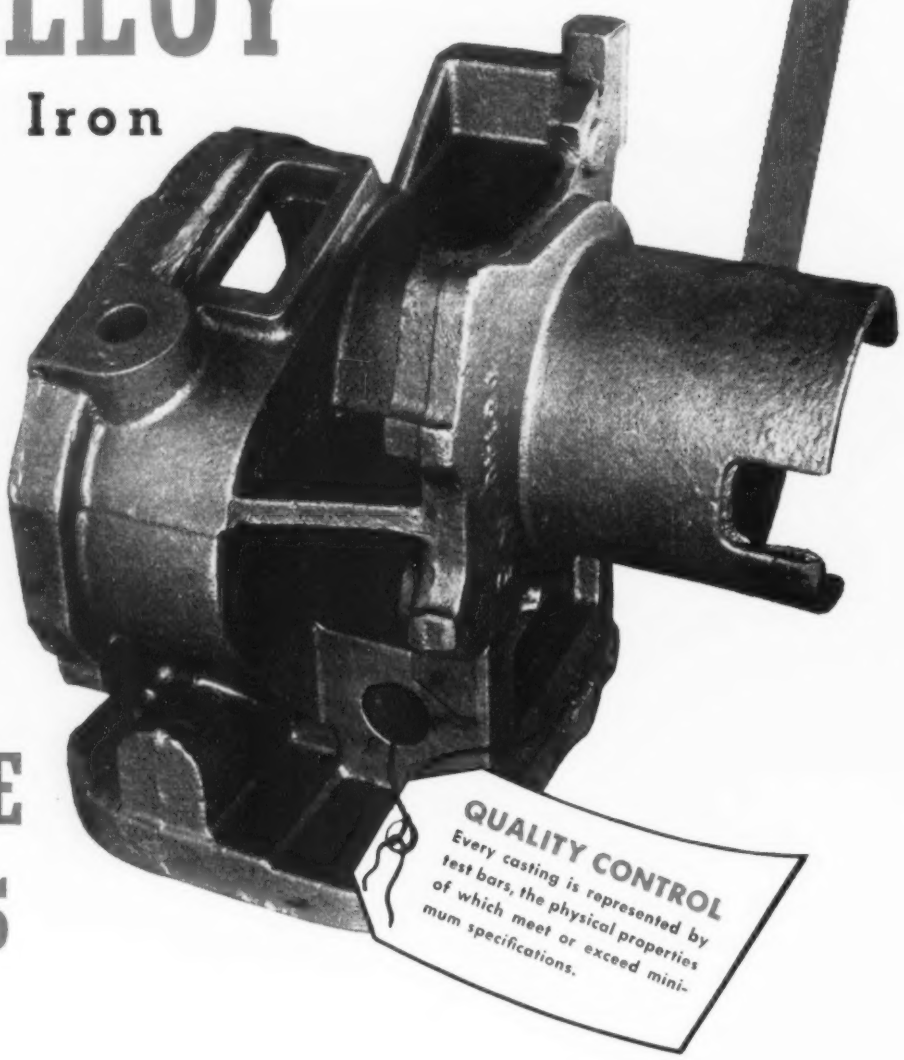
DUCTALLOY

Ductile Iron

for

INTRICATE CASTINGS

Intricate fire-control housing cast in DUCTALLOY


QUALITY CONTROL
Every casting is represented by test bars, the physical properties of which meet or exceed minimum specifications.

DUCTALLOY, the new cast iron, combines high tensile strength with good fluidity. These qualities make it particularly valuable for intricate castings that would be difficult to cast in steel, but would not be strong enough in gray iron.

DUCTALLOY'S spheroidal graphite structure increases pressure tightness compared to flake iron. It machines easily and the machined surface compares favorably with that of steel.

Strength, toughness, machinability and many other desirable qualities make DUCTALLOY an exceptionally useful and economical material for a wide range of applications. Write today for information about its many possibilities and advantages.

AMERICAN Brake Shoe COMPANY

BRAKE SHOE AND CASTINGS DIVISION
230 Park Avenue, New York 17, N. Y.

9042

Lead-Zinc Profits Dropped by Dumping

Sharp dip in lead prices reflects dumping on London free market . . . Hits pocketbooks of Canadian producers . . . Plant of Atlas Steel to get continuous caster—*By F. Sanderson.*

The sharp drop in lead prices over the past month, a reflection of the heavy dumping on the London free market, and prospects that zinc is slated for the same fate, has resulted in a sharp cut in earnings of Canadian lead-zinc producers. Locally it is believed that lead prices have hit bottom but until an upward swing is indicated Canadian producers will continue to worry.

In British Columbia, Canada's chief source of lead supply, lead and zinc expansion programs are being suspended until the price situation clears. In other sections, mine operators have started to lose some interest. Unless prices start bouncing back soon, new mine development will slow down.

Copper prices continue to hold and production in this field is mounting. Overall earnings of producers are holding around last year's level.

Mill Delivery—East Rim Nickel Mines Ltd., has purchased a 500-ton milling unit which will be delivered to the company's property in the Sudbury area next March. Foundations are expected to be ready by that time. East Rim Nickel Mines is shipping about 125 tons of ore daily to the Falconbridge mill for treatment under a contract with a United States government agency.

Continuous Caster — Canada's first continuous steel casting machine will be installed at the Welland plant of Atlas Steels Ltd.

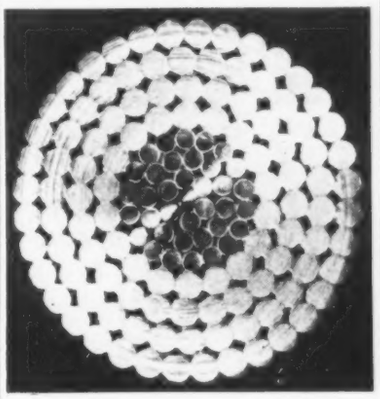
The equipment is expected to produce from 10 to 15 pct more finished steel per heat than conventional pouring methods.

Operation will be under the Ross-Junghans patent rights controlled in Canada and the U. S. by Continuous Metalcast Co., New York. It will be engineered and built by the Koppers Co., Inc., Chicago. The machine is to be assembled and tested by Bartlett Hayward in Baltimore before installation at Welland.

The continuous caster will be used for production of high speed, tool, stainless and special alloy steels. First production is scheduled for late in 1953. This latest installation, costing $1.5 million will bring expenditures by Atlas Steels on new production equipment to a total of $11.5 million since 1950.

Ore Record—Production of iron ore in Canada set a new monthly record during July, Dominion Bureau of Statistics reports. Output rose to 902,900 tons from the previous month's level of 646,700 tons.

For the 7 months ended July 31, 1952, iron ore production rose 22 pct to 2,644,300 tons. Output for the same period last year was 2,167,300 tons. Principal iron ore producers in Canada are: Dominion Steel & Coal Co., with mines at Wabana, Newfoundland; Steep Rock Iron Mines Ltd., in the Atikokan section of Ontario and the Algoma Ore Properties Ltd., in Algoma.



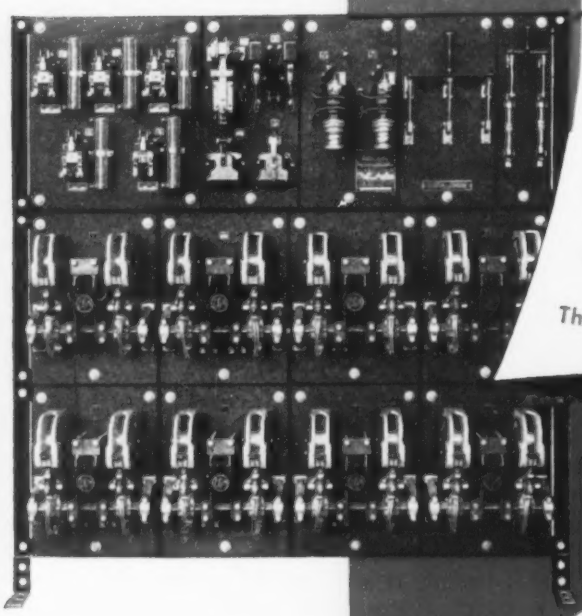
NO OVERLOAD: Shown in a cross section of what is said to be the world's largest stranded electrical cable ever made for an overhead transmission line. It will be used by Aluminum Co. of Canada for its big development in British Columbia. The cable is over 2½ in. in diam and consists of 108 aluminum wires over a core of steel wires. It will carry power over a mountainous 10-mile pass. The cable will have an ultimate strength of 135,700 lb and must resist heavy winds and ice.

Copper for America—Campbell Chibougamau Mines Ltd. has a contract with the U. S. Defense Materials Procurement Agency. It assures the company a market for 63.2 million lb of copper. The company will speed development work at its Chibougamau, Quebec, property to bring it into production with a milling rate of better than 2000 tons daily. Under its present schedule production should be attained before the end of 1954, at an estimated cost of $6 million.

Under the agreement production of refined copper is to start by December, 1954, and is to reach an annual peak of about 37.5 million lb, with a total of 63.2 million lb to be delivered by Dec. 31, 1956. The contract may be terminated before that time if the company has received a cash return of $6.3 million, after deduction of operating expenses.

Refinery Growth—British American Oil Co. Ltd. plans an $8 million expansion program for its refinery at Clarkson, Ont. Plans call for installation of a catalytic cracking unit, a catalytic polymerization unit, gas concentration and other facilities.

Power—The U. S. Congress or the Federal Power Commission can now make America a partner of Canada in developing the St. Lawrence River hydro-electric power project. International Joint Commission on Boundaries has approved development of the project. New York State Power Authority has applied for federal permission for joint development with Canada.



LOOK for these NAMES when buying Motor Control

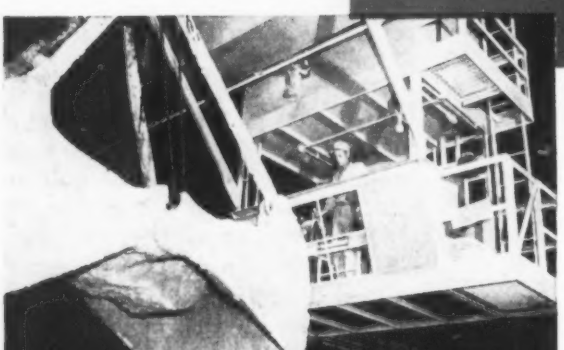
1 LINE-ARC Contactors
2 TIME-CURRENT Acceleration (D-c)
3 FREQUENCY RELAY Acceleration (A-c)
4 WRIGHT CIRCUIT Hoist Control (D-c)
5 YOUNGSTOWN Hoist Limit Stops
6 TYPE WB Brakes
7 CAM Master Switches
8 MANUAL-MAGNETIC Disconnect Switches
9 CONTRA-TORQUE Hoist Control (A-c)
10 TAB-WELD Resistors

These FUNCTIONAL NAMES Speak for Themselves

CONTRA-TORQUE
REG. U.S. PAT. OFF.
for A-c Hoists

Better Speed Selection..

Improves OUTPUT



Bucket crane in fertilizer plant.

Magnet gantry crane serving scrap baler installation.

REDUCED torque values for better lowering speeds, suited to the load and ability to start lowering on *any* speed point of the master switch, provide great flexibility, permitting increased production.

Operators are quick to take advantage of the characteristics of EC&M CONTRA-TORQUE Controllers: slow speeds to land a load carefully—using the last point for fast lowering—decelerating the load on intermediate points or using any of these points to release the brake and start down.

Safeguarding the operation at all times are EC&M FREQUENCY RELAYS. If a heavy load speeds up on a weak torque point, these relays automatically switch connections to a strong torque point, checking the motor speed and allowing operation to continue safely.

For bucket and magnet hoists, and similar cranes with permanently loaded hooks, specify EC&M CONTRA-TORQUE Control.

THE ELECTRIC CONTROLLER & MFG. CO.
2698 EAST 79TH STREET • CLEVELAND 4, OHIO

E&M

FREE PUBLICATIONS

These publications describe money-saving equipment and services . . . they are free with no obligation . . . just circle the number and mail the postcard.

Flexible tubing

A complete line of flexible tubing in diameters ranging from less than 1 to 30 in. is described in a new 4-p. bulletin available from Flexible Tubing Corp. The ducting, made of fabric supported rubber or plastic wound on helical spring wire coils is lightweight, retractable, non-collapsible and non-kinkable. And it is flexible enough to permit turns up to 180°. Uses of the tubing include portable and semi-permanent ventilation, fume removal, dust collection and materials handling. *Flexible Tubing Corp.*

For free copy circle No. 1 on postcard.

Packaging

General Box Co., specialists in engineered shipping containers, have published an interesting new booklet describing the company's packaging facilities. Included is information on the company's container testing apparatus, case histories of improvement made in particular package designs and a discussion of how money can be saved by the use of proper containers. *General Box Co.*

For free copy circle No. 2 on postcard.

Air cylinders

Among the many features of Lindberg air cylinders described in a new booklet are seamless steel tubing, one-piece aluminum alloy pistons, Block-Vee packings and simplified packing replacement. Use of these air cylinders effects considerable savings through reduction and elimination of costly mechanisms involving cams and gear drives. *Lindberg Engineering Co.*

For free copy circle No. 3 on postcard.

Castings

The Tincher Process for reclaiming casting rejects made unusable because of porosity is thoroughly discussed in a new bulletin. Success of the method is a result of its ability to convert a "leaker" to a permanent, pressure-tight casting at low cost. Description of the process is treated in an easy to read question-answer form. *Tincher Products Co.*

For free copy circle No. 4 on postcard.

Industrial freezers

Information on industrial freezers as well as complete temperature range testing units made by Webber Appliance Co. is available in a new 8-p. folder. Included are data on performance characteristics, sizes, temperature range and applications for industrial freezers and range testing units. *Industrial Freezer Div., Webber Appliance Co., Inc.*

For free copy circle No. 5 on postcard.

Turn Page

use postcard below

Postcard valid for 8 weeks only. Information may be secured subsequently by separate letters fully describing each item wanted, including company name.

FIRST CLASS
PERMIT No. 36
(Sec. 34.9 P.L.&R.)
New York, N. Y.

BUSINESS REPLY CARD
No postage necessary if mailed in the United States

POSTAGE WILL BE PAID BY

THE IRON AGE
Post Office Box 77
Village Station
NEW YORK 14, N. Y.

Postcard valid 8 weeks only. After that use own letterhead fully describing item wanted. 11/6/52

Circle numbers for Free Publications or information on New Equipment:

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40	41	42	43	44	45
46	47	48	49	50	51	52	53	54	55	56	57	58	59	60

If you want more details on other products advertised in this issue fill in below:

PAGE .....PRODUCT .....
PAGE .....PRODUCT .....
PAGE .....PRODUCT .....

YOUR NAME .....TITLE .....
COMPANY .....
CO. ADDRESS .....
CITY .....ZONE .....STATE .....

Free Publications

Continued

Filters

Delpark filters, discussed in a new brochure, are available in two types, an endless belt-type and a disposable model. The filters come in capacities ranging from 2 gph to units capable of filtering several hundred gpm. *Industrial Filtration Co.*

For free copy circle No. 6 on postcard.

Protective painting

It is no longer necessary to apply special application techniques when using vinyl base paints for maintenance painting. Prufcoat Laboratories has developed a new primer that makes possible the application of vinyl coatings in the same manner as ordinary paints. Details on the amazing new primer are contained in a new technical bulletin No. 015. *Prufcoat Laboratories, Inc.*

For free copy circle No. 7 on postcard.

Wire rope

As a guide to improved wire rope service, S. Leschen & Sons Rope Co. has issued a pocket-size booklet outlining proper methods of handling, reeving, breaking in, splicing, cutting, lubricating and ordering wire rope. The publication is well illustrated and contains many tables. *A. Leschen & Sons Rope Co.*

For free copy circle No. 8 on postcard.

Switches

Micro Precision Switches listed in a new catalog are designed to control alternating current circuits in industrial and commercial applications. In addition to descriptions and specifications of the many types of switches available, a price list is included in the catalog. *Micro CMS Switch Div., Minneapolis-Honeywell Regulator Co.*

For free copy circle No. 9 on postcard.

Contactors

Allis-Chalmers new line of heavy-duty, single-pole, dc contactors for use on rolling mill controls, mill auxiliaries, cranes, hoists and related equipment is designed for prolonged contact life. Extension of contact life is achieved by a new principle of arc interruption which reduces contact burning by speeding arc extinction. The new contactors are available with or without electrical auxiliary interlocks in ratings of 600, 300 and 150 amp at 600 v maximum. More information is contained in a new folder. *Allis-Chalmers Mfg. Co.*

For free copy circle No. 10 on postcard.

Electroplating

Baker & Adamson Metal Fluoborate Solutions are used in industry to electroplate a wide range of metals including lead, tin, iron, copper, nickel, cadmium, indium. In a new booklet describing these plating solutions, information is given on how they are used to speed output, cut operating costs and save scarce metals. *General Chemical Div., Allied Chemical & Dye Corp.*

For free copy circle No. 11 on postcard.

Platecoils

The how and why of savings made by Platecoils in heating and cooling processes are described in detail in a new 20-p. brochure that may be obtained from Kold-Hold Mfg. Co. Use of Platecoils instead of pipe coils saves money since they cost less initially, heat or cool up to 50 pct faster and take only half as much tank space as pipe coils. *Kold-Hold Mfg. Co.*

For free copy circle No. 12 on postcard.

Metalworking

A new folder has been prepared which is designed to show that Rigid-Tex Metal can be worked as easily as any other metal. Rigid-Tex metal can be used wherever ordinary flat-rolled metal is practical. It can be welded, soldered, riveted, stamped, formed drawn and lock-seamed. *Rigidized Metals Corp.*

For free copy circle No. 13 on postcard.

Turn Page

use postcard below

Postcard valid for 8 weeks only. Information may be secured subsequently by separate letters fully describing each item wanted, including company name.

Postcard valid 8 weeks only. After that use own letterhead fully describing item wanted. 11/6/52

Circle numbers for Free Publications or information on New Equipment:

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40	41	42	43	44	45
46	47	48	49	50	51	52	53	54	55	56	57	58	59	60

If you want more details on other products advertised in this issue fill in below:

PAGE .....PRODUCT .....
PAGE .....PRODUCT .....
PAGE .....PRODUCT .....

YOUR NAME .....TITLE .....

COMPANY .....

CO. ADDRESS .....

CITY .....ZONE .....STATE .....

NATURE OF BUSINESS .....

FIRST CLASS
PERMIT No. 36
(Sec. 34.9 P.L.&R.)
New York, N. Y.

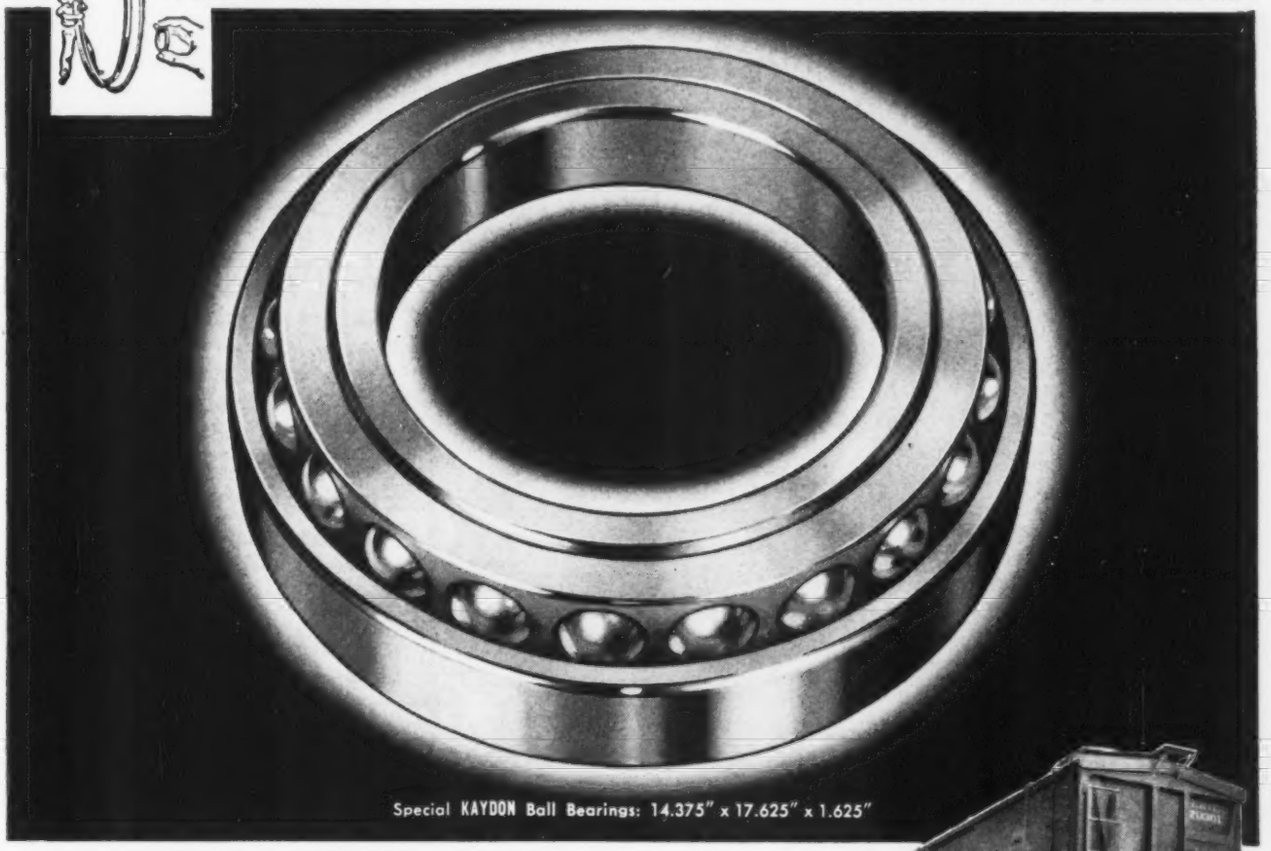
BUSINESS REPLY CARD
No postage necessary if mailed in the United States

POSTAGE WILL BE PAID BY

THE IRON AGE
Post Office Box 77
Village Station
NEW YORK 14, N. Y.

Contact KAYDON of Muskegon

FOR ALL TYPES OF BALL AND ROLLER BEARINGS: 4" BORE TO 120" OUTSIDE DIAMETER



Special KAYDON Ball Bearings: 14.375" x 17.625" x 1.625"

KAYDON-bearinged Lift Trucks pick up 30-ton freight cars

HUSKY KAYDON Special Ball Bearings . . . with static thrust capacity of 120,500 lbs. each . . . help Automatic Skylift Giant Electric Trucks lift multi-ton loads smoothly, efficiently. Made by Automatic Transportation Company, these KAYDON-bearinged trucks live up to their claim to "lighten life's loads." They shoulder heavy responsibilities without flinching!

The precision of these bearings is vital to the steering ease of these powerful lift trucks. They support the heavily loaded trail axle wheels, for steering ease. Diametrical ball clearance is closely held. These special ball bearings are typical of the unusual designs KAYDON engineers create to help machine designers achieve their objectives.

For dependable counsel on Precision Bearings and Needle Rollers, contact KAYDON of Muskegon.

KAYDON Types of Standard and Special Bearings:
Spherical Roller • Taper Roller • Ball Radial • Ball Thrust • Roller Radial • Roller Thrust • Bi-Angular Bearings

THE KAYDON ENGINEERING CORP.

MUSKEGON • MICHIGAN

PRECISION BALL AND ROLLER BEARINGS

Squeezed like an accordion, welded tubing demonstrates uniform strength

● This compression folding of a section of electric-welded steel tubing produces no cracks or flaws. Such uniform strength is proved in many other severe cold forming operations. U. S. Bureau of Standards tests show that the weld is as strong as the wall, and that it has the same qualities as the steel.

Investigate the economy and physical advantages of Brainard welded steel tubing in *your* products. Write Brainard Steel Division, Dept. O-11, Griswold Street, Warren, Ohio. An integrated producer; offices throughout the U. S.

Brainard
SHARONSTEEL
STEEL DIVISION
SHARON STEEL CORPORATION

WELDED STEEL TUBING

—Free Publications—

Continued

Stub reamers

Pratt & Whitney stub reamers assure outstanding performance on all jobs requiring short reaming tools. These job-proved stub reamers, primarily engineered for automatic screw machine work, are also used extensively for drill press and hand screw machine operations. When used with P & W floating holders, the stub reamers produce superior holes that are round, straight, smooth and accurately sized. More details are contained in a new leaflet. *Pratt & Whitney, Div. of Niles-Bement-Pond Co.*

For free copy circle No. 14 on postcard, p. 135.

Prototype equipment

The Mechanical Div. of Arthur D. Little, Inc., specializes in the development and manufacture of prototype equipment, particularly in the fields of thermodynamics, heat transfer, refrigeration, vacuum engineering, gas liquefaction, electromagnetism, mechanical design, and vibration. A complete review of the company's prototype development service is carried in a new publication. *Arthur D. Little, Inc.*

For free copy circle No. 15 on postcard, p. 135.

Speed reducers

Complete engineering information and selection data on the complete line of Dodge Torque-Arm Speed Reducers and the new Dodge Overload Release designed for use with the reducer is contained in a new bulletin. A new size has been added to the Dodge line of reducers which raises its capacity range to 43 hp. *Dodge Manufacturing Corp.*

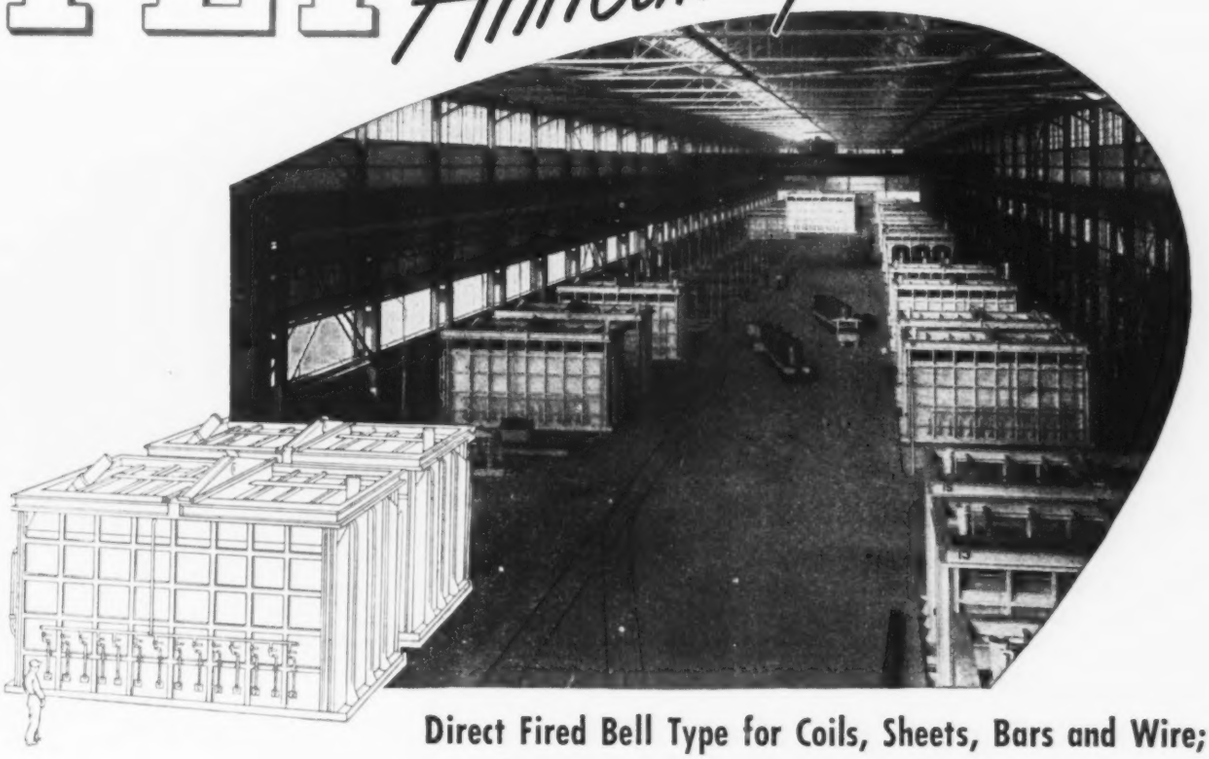
For free copy circle No. 16 on postcard, p. 135.

Magnetic alloys

An 8-p. booklet on magnetic alloys has been prepared by Westinghouse Electric Corp. The various alloys that are covered include Hipernik, Hipernik V, Conpernik and Hiperco, the first three of which are iron-nickel alloys while the last is an iron cobalt alloy. Inclusion of 15 core loss and magnetization curves makes the booklet especially valuable. *Westinghouse Electric Corp.*

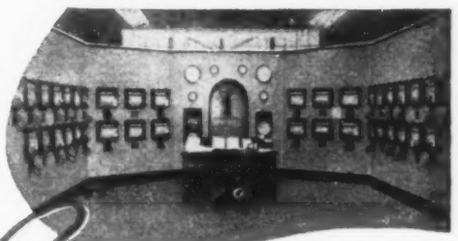
For free copy circle No. 17 on postcard, p. 135.

F·E·I· *Annealing Furnaces*



Direct Fired Bell Type for Coils, Sheets, Bars and Wire; Complete Heating Lines for All Kinds of Armament: Guns, Armor Plate, Shells, Bombs, etc.

Fast! Efficient! Improved! F.E.I. Annealing Furnaces and Complete Armament Heating Lines are planned, engineered and built to do an outstanding job. Leaders of industry in America and abroad recognize Furnace Engineers' advanced heating methods, based on over thirty years' experience. F.E.I.'s patented, automatically controlled combustion system provides high metallurgical quality and economical operation. Consult us about improving YOUR plant's annealing performance—whether the need is for an entirely new installation or the modernization of existing furnaces.



Completely Automatic

- ***Easy to operate — even without previous experience.***
- ***Maintenance practically nil.***
- ***Minimum critical materials required.***

Photographs above show a battery of F.E.I. annealing furnaces in a large eastern steel mill; all furnaces are controlled automatically from a single Remote Control Room. F.E.I. also builds Open Hearth Furnaces, Soaking Pits, Continuous Reheating Furnaces, Forging Furnaces, and other heating lines.

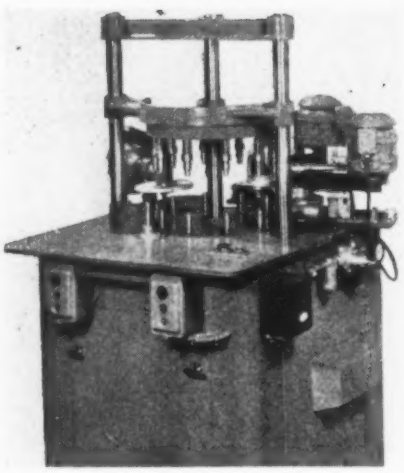
Furnace Engineers, Inc.

F. E. I. Building • 1551 West Liberty Avenue • Pittsburgh 16, Pa.

AFFILIATES — *Great Britain*: Salem Engineering Co., Ltd., Milford near Derby, England; *France, Belgium, Holland, Luxembourg and Italy*: Heurtey & Co., 38 Av. G. Mandel, Paris XVI, France.

NEW EQUIPMENT

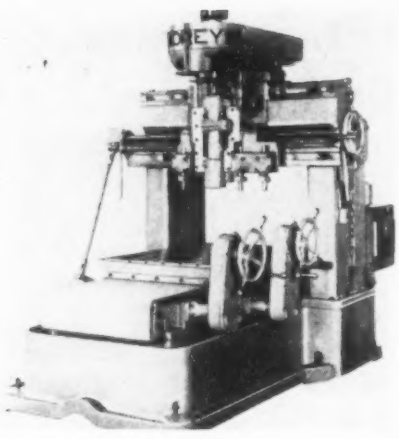
New and improved production ideas, equipment, services and methods described here offer production economies . . . just fill in and mail the postcard on page 135 or 136.



Automatic flash lathe speeds secondary operations

A 10-spindle automatic flash lathe, with intermittent motion on the turret is useful in the metal trades industry as well as the plastic industry for which it was originally designed. It is adapted for secondary operations on small circular metal parts, flash trimming of die castings, finishing of electrical parts, deburring, and varied finishing operations on circular parts. The machine consists of a 10-spindle rotary table, the spindles having variable speeds from 700 to 2000 rpm. Top wheel is adjustable up and down; spindles retract for work ejection and piece loading. The top cam allows spindles to lower and hold work securely directly after loading, and locating it perfectly for finishing operations at various work stations. Ten station index is air-powered, hydraulically checked, and electrically controlled. The lathe has continuous automatic cycling. *J. M. Nash Co.*

For more data circle No. 18 on postcard, p. 135.



Machine designed for milling large forgings

Milling and profiling large forgings and castings such as aluminum and magnesium air frames, cast iron parts and steel forgings are possible on a new heavy duty machine. The vertical Aeroframe profiler and milling machine combines rigidity of construction with maximum power to take full advantage of tungsten carbide tools. The 40M has a two-speed 15 hp motor and operates through a back-geared drive to provide spindle speed of 125 to 4600 rpm. Vibrations are minimized at the cutting tools. Centralized one-shot lubrication simplifies maintenance. The profiler has taper and straight follower holders. Control arms are adjustable to suit convenience of the individual operator. The machine can have a 10-ft long table. *Morey Machinery Co., Inc.*

For more data circle No. 19 on postcard, p. 135.

Fast way to grind OD's concentric to bores

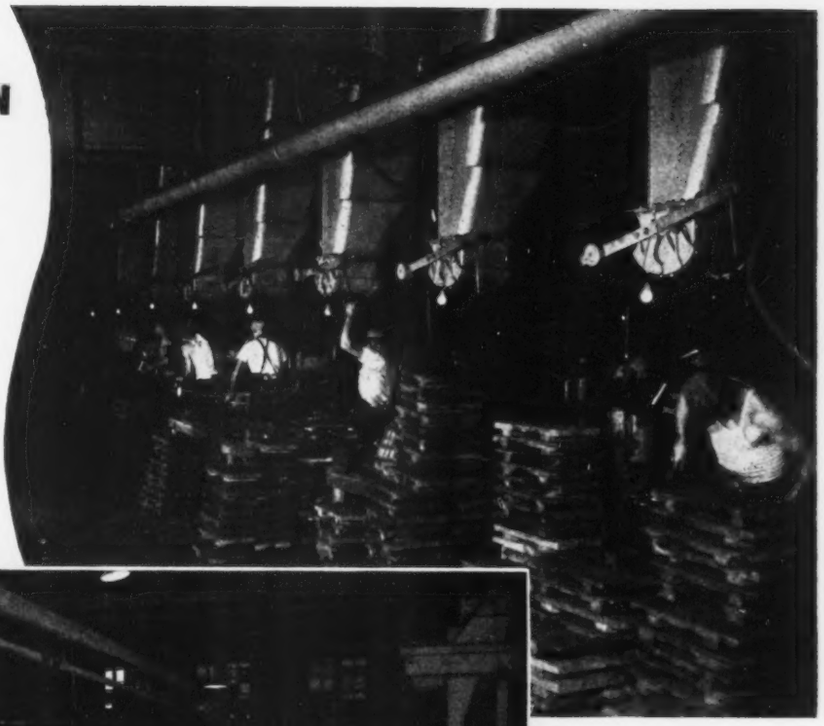
Workpieces such as anti-friction bearing races or rings for precision mechanisms can be OD ground within extremely close limits for concentricity. This is made possible by a new method of workholding incorporated in the new Landis 4-in. concentric grinder. The principle utilizes a revolving face plate which is a permanent magnet. The workpiece revolves about an arbor which has two wear resistant strips set in it lengthwise. In operation, the work arbor is moved to a position aside of, and near the center of the revolving face plate. The two wear resistant strips are spaced above and below the horizontal line on the side of the bore nearest the grinding wheel. In effect, an internal V-type support is provided. The 16-in. diam grinding wheel is driven from a 3 hp motor. *Landis Tool Co.*

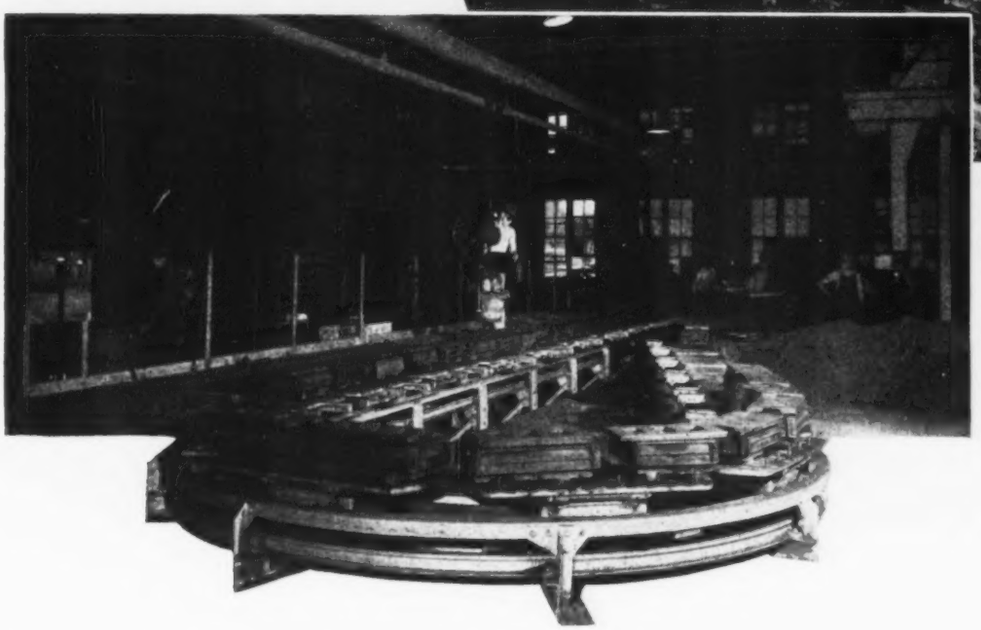
For more data circle No. 20 on postcard, p. 135.

Turn Page

NO MODERNIZATION WITHOUT MECHANIZATION

So Call In a JEFFREY ENGINEER





These two photos depict a Jeffrey-equipped Foundry. It is completely modernized to provide the ultimate in plant efficiency. Our Foundry Engineers are generous in their desire to help you modernize your operations.

Aerators
Bucket Elevators
Chains
Clamshell Valves
Cleanarators
Crushers

Casting Conveyors
Disintegrators
Feeders
Flask Fillers
Apron Conveyors

Paddle Mixers
Power Scoops
Mold Conveyors
Screens
Sanditioners

There must be a heap of satisfaction in having a completely-modernized Foundry . . . a smooth-running and harmonious system. Jeffrey has the equipment . . . the engineers to help you do just that . . . provide performance that enthuses the owner and the foundry superintendent alike. Give us a chance to go to work for you.

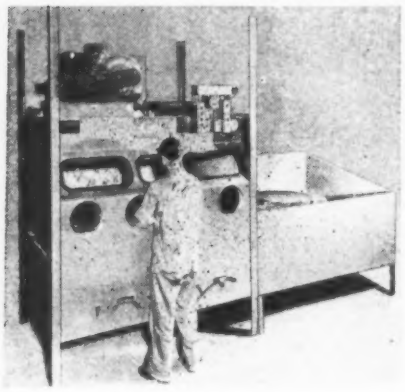
THE JEFFREY MANUFACTURING COMPANY

YEARS

925 North Fourth St., Columbus 16, Ohio

Baltimore 2 Boston 16 Cincinnati 2 Detroit 13 Houston 2 New York 7 St. Louis 1
Beckley, W. Va. Buffalo 2 Cleveland 15 Forty Fort, Pa. Jacksonville 2 Philadelphia 3 Salt Lake City 1
Birmingham 3 Chicago 1 Denver 2 Harlan, Ky. Milwaukee 2 Pittsburgh 22

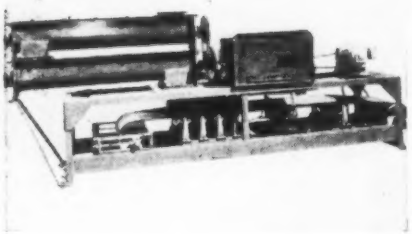
Jeffrey Mfg. Co. Ltd., Montreal, Canada
British Jeffrey-Diamond Ltd., Wakefield, England
Jeffrey-Galion (Pty.) Ltd., Johannesburg, S. A.
The Galion Iron Works & Mfg. Co., Galion and Bucyrus, Ohio
Galion (Great Britain Ltd.), Wakefield, England
The Ohio Malleable Iron Co., Columbus, Ohio
The Kilbourne & Jacobs Mfg. Co., Columbus, Ohio



Wet blast machine handles large, heavy pieces

Fine mesh abrasives, suspended in water, are propelled at the work by compressed air, in this new wet blasting machine. Close-tolerance dimensions are maintained and sharp corners, lines and lettering in patterns and other vulnerable areas remain undamaged and unaltered. Model 64 Liquamatte will handle single pieces or loads of pieces up to 3500 lb. Operator manipulates the abrasive gun and the worktable with his hands while operating the compressed air valve with his knee. After blasting the work car is rolled out onto the power rinse tank. Immersion heater units for the rinse water dry parts faster with less chance of oxidation. *American Wheelabrator & Equipment Corp.*

For more data circle No. 21 on postcard, p. 135.



Feed regulating machine weighs fine materials

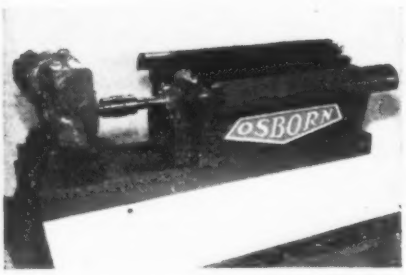
A new feed regulating Transporto-weigher automatically and continuously transports, weighs and maintains pre-set rate of feed of any finely divided material in the chemical and processing industries, smelting and refining, mining. Capacity can be any rate within 10 to 24 tons per hr. The integrator records on a direct reading tonnage totalizer the tonnage passing over the belt. Tonnage indicator shows instantaneous weighing rate. *Sintering Machinery Corp.*

For more data circle No. 22 on postcard, p. 135.

Furnace charger has 4000-lb capacity

The lift necessary on a new furnace charger truck to pick up and deposit the loads is provided through a tilting action of the load carrier, which pivots backward a maximum of 10°. Chassis is essentially a Mercury rear control stand-up Yak fork truck model, which retains the heavy duty drive, the controlled caster steering axle and the automotive steering and four-speed travel control of the standard fork truck. The chassis is equipped with a gas-electric power source. *Mercury Mfg. Co.*

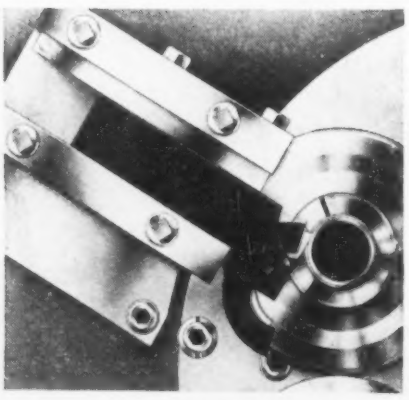
For more data circle No. 23 on postcard, p. 135.



Brushing unit cleans conveyer belts

This conveyer cleaning unit consists of a special 12-in. diam brush coupled to gear head motor, which is built on a channel base with an opening under the brush so that material cleaned from the conveyer may be carried away for reclamation. Special guards guide the brushed off material into the channels. The motor driving the brush may be coupled into the belt drive so that the brush stops when the belt stops. *Osborn Mfg. Co.*

For more data circle No. 24 on postcard, p. 135.

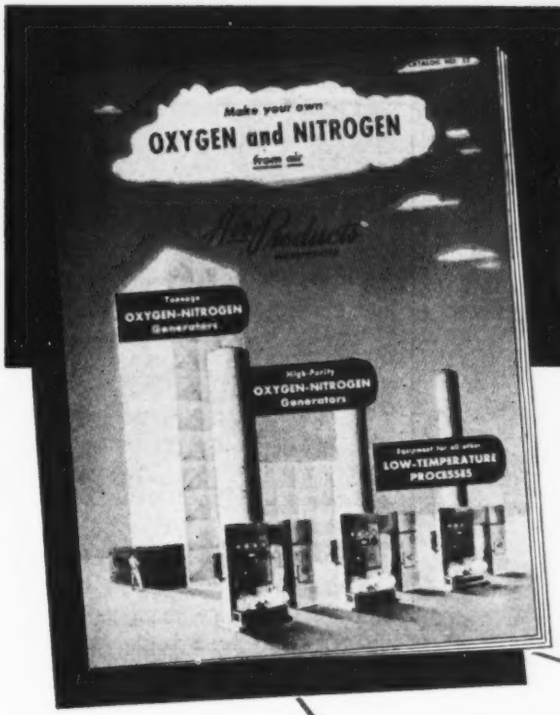


Cut-off tool has circular blade

New cutoff tool, based on a different concept of tool design, is fundamentally a semi-circular disk of finest grade high speed steel, with the cutting surface in the periphery. The blade is mounted in a holder with all but the necessary cutting edge protected by an envelope or shroud. The tool is so ground that when the lead or cutting edge of the tool is in the same plane as the front of the holder, it is properly positioned. Tool holder is accurately located in the machine so that the cutting edge of the tool is in the spindle center line. The present holder can be substituted for the conventional straight blade holder in most screw machines up to 1⅝ in. capacity. *New Britain Machine Co.*

For more data circle No. 25 on postcard, p. 135

Turn Page



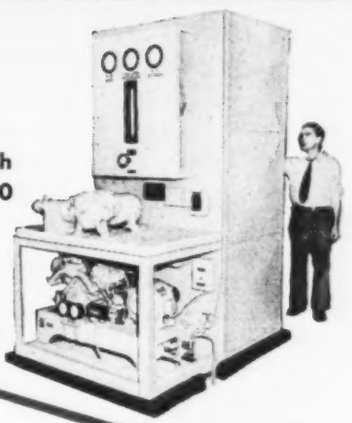
Cut Costs! NEW CATALOG

shows how you can make your own

OXYGEN, NITROGEN

High-Purity
OXYGEN-NITROGEN
Generators

14 standard models, with capacities from 300 to 12,000 cubic feet per hour



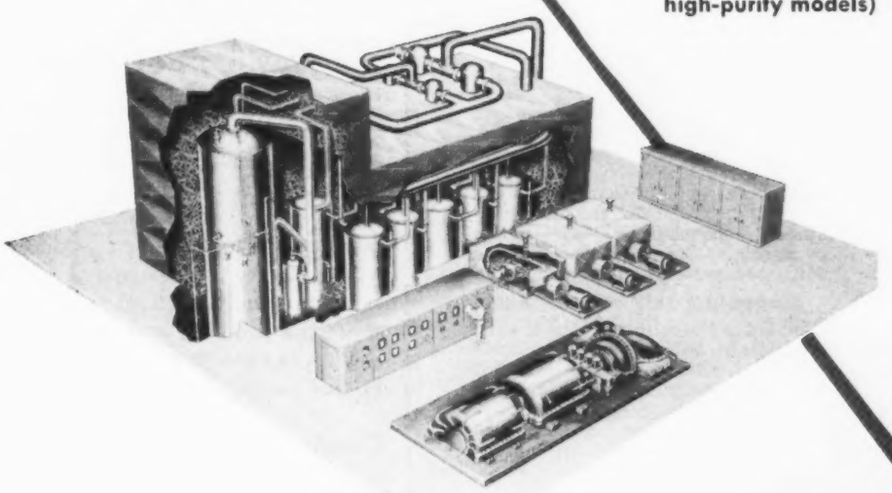
NEW!

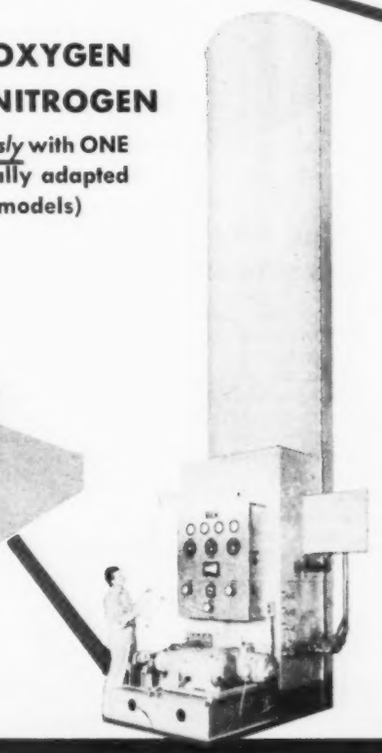
99.9% Pure OXYGEN
99.99% Pure NITROGEN

made *simultaneously* with ONE generator (specially adapted high-purity models)

Tonnage
OXYGEN-NITROGEN
Generators

9 standard models, with capacities from 25 to 500 tons of oxygen per day





Air Products
INCORPORATED
OXYGEN-NITROGEN-ARGON
GENERATORS
Specialists in Equipment for All Low-Temperature Processes

For your FREE COPY, fill out and mail

Air Products, Incorporated
Dept. I, Box 538, Allentown, Pa.

NAME.....TITLE.....
COMPANY.....
ADDRESS.....
CITY.....STATE.....

Kemp Immersion Melting Pots won't CRACK or BREAK

Save up to 40% on fuel with greater heating surface, faster heat recovery

More and more plants depend on Kemp Immersion Heating for *continuous, trouble-free* performance. Kemp pots, unlike underfired pots, can be used steadily in annealing, coating, tempering, descaling, etc. ... without the threat of *periodic* and *expensive* shutdowns for breakage. And each new Kemp installation means you eliminate costly temperature override, dangerous open flame fire hazards and the clutter of unsightly external pipes and ducts.

EFFICIENCY WITH ECONOMY

With Kemp Immersion Heating, you are assured maximum melting or heating efficiency... *plus* an estimated savings in fuel of up to *40% and more.* Thanks to Kemp engineering, these savings are built into every unit. You get greater heating surface, faster heat recovery, lower dross formation, even lower room temperatures. There's no brickwork to steal heat . . . no external combustion chamber . . . no carbon monoxide. You're money ahead when you switch to Kemp.

EASY TO USE, EASY TO MAINTAIN

The Kemp Carburetor, part of each installation, delivers complete combustion ... without waste ... without tinkering. One-pipe air and fuel feed reduces installation costs, simplifies maintenance. Kemp service also includes a staff of trained technicians who are instantly available at all times.

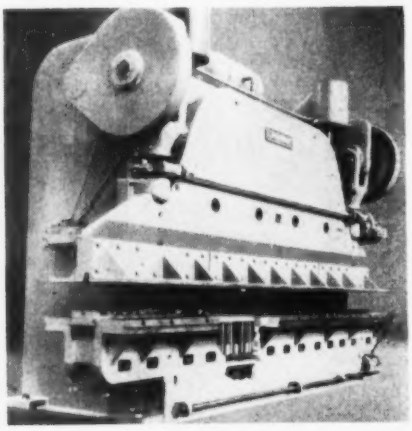
KEMP ***IMMERSION MELTING POTS***
OF BALTIMORE

for technical information and facts on how we can help you cut your melting costs, write:

THE C. M. KEMP MFG. CO.
405 E. Oliver St., Baltimore 2, Md.

CARBURETORS • BURNERS • FIRE CHECKS • ATMOSPHERE & INERT GAS GENERATORS
ADSORPTIVE DRYERS • METAL MELTING UNITS • SINGEING EQUIPMENT • SPECIAL EQUIPMENT

Continued



Press brake

All-steel press brake can be used for shallow draw work as well as conventional press brake work. It has a double plate bed, 30 in. wide, and 15 ft 8 in. in overall length. There are fourteen 6-in. air cylinders mounted between plates for operating draw rings, knockout bars, and similar units. The machine weighs 72,000 lb, has a speed of 23 strokes per min and has removable ram angles for press or brake operations. Additional features include air counterbalances and horns on each end of the bed and ram. *Cincinnati Shaper Co.*

For more data circle No. 26 on postcard, p. 135.

Magnesium dock board

Designed for specific use in truck loading operations, a line of standard magnesium dock boards are prefabricated in a wide range of sizes. The all-magnesium unit combines bridge design strength with extreme lightness and easy, one-man handling. Two rated load capacities are 1000 and 2000 lb per axle. *Magline, Inc.*

For more data circle No. 27 on postcard, p. 135.

Clamping attachment

A new 2000-lb electric truck has clamping attachment for handling lightweight packages in storage areas, on docks, and in highway trailers. The clamp is hydraulically powered and will open to accommodate crates as wide as 60 in. It can lift these crates up to 130 in. in the air for stacking. *Yale & Towne Mfg. Co.*

For more data circle No. 28 on postcard, p. 135.

Heat-resistant gloves

All-leather heat-resistant gloves can take temperatures to 800°F. The gloves are said to be pliable, durable, comfortable and economical. The soft, flexible leather is impregnated with insulating and refractory materials. Inseam construction guards the threads against undue wear. *Mine Safety Appliance Co.*

For more data circle No. 29 on postcard, p. 135.

Soldering iron

Within 6 sec the improved German-made Primax Solderer reaches soldering heat. A current of high amperage is produced in the transformer which brings the soldering tip to almost instantaneous high soldering point. The soldering iron has a balanced grip with trigger control for easy soldering on hard-to-reach jobs. It is compact, weighs 22 oz. Special alloy tip lasts indefinitely under normal usage. *Paul C. Roche Co., Inc.*

For more data circle No. 30 on postcard, p. 135.

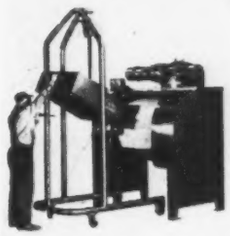
Tubular riveting

Automatic rivet setting equipment provides greater speed of tubular riveting through simplification of loading and control of operator speed. Combining a 40-in. diam rotating dial fixture equipped with 12 fixture stations, the unit feeds and clinches three tubular rivets simultaneously through one single setting and two double setting automatic rivet setters. Elements are standard design, though the combination is built to order to suit the particular item being riveted. *Chicago Rivet & Machine Co.*

For more data circle No. 31 on postcard, p. 135.

Turn Page

FREE!



Supersheen Model DB-200. An example of Supersheen superiority. This advanced design barrel handles micro-finishing of small precision parts with same ease as fast cutting down of larger castings, forgings, etc.

Why worry about man power shortages and high-cost labor? These two BIG PROBLEMS are now being solved by large and small manufacturers with Supersheen Advanced Barrel Finishing Equipment. *A SINGLE UNIT INSTALLATION REPLACES FROM 2 TO 12 MEN*—savings run as much as 95% under former finishing methods. Mail coupon at right for complete information.

FREE SAMPLE PROCESSING

ALMCO
Supersheen

AMERICA'S LARGEST MANUFACTURER OF ADVANCED BARREL FINISHING EQUIPMENT—MATERIALS AND COMPOUNDS
ALBERT LEA, MINNESOTA

1. **IF YOU PRODUCE PARTS THAT REQUIRE FINISHING OF ANY KIND...** this 22 page booklet is *guaranteed* to open your eyes! It gives you the inside story of advanced barrel finishing *as never told before!*

2. **COMPLETE CATALOG...** of America's most complete line of advanced barrel finishing equipment. *All types!* Barrel sizes range from 8" x 16" to 30" x 60". *All-mechanical* loading and unloading equipment, separating and storage equipment, etc. *For large and small plants.*

3. **FOR THE FINEST FINISH EVER...** Almco Supersheen Abrasive Chips and "Concentrated" Compounds. For *any and all* types of barrel finishing! Catalog gives specific data on the industry's *most complete line* of barrel finishing materials.

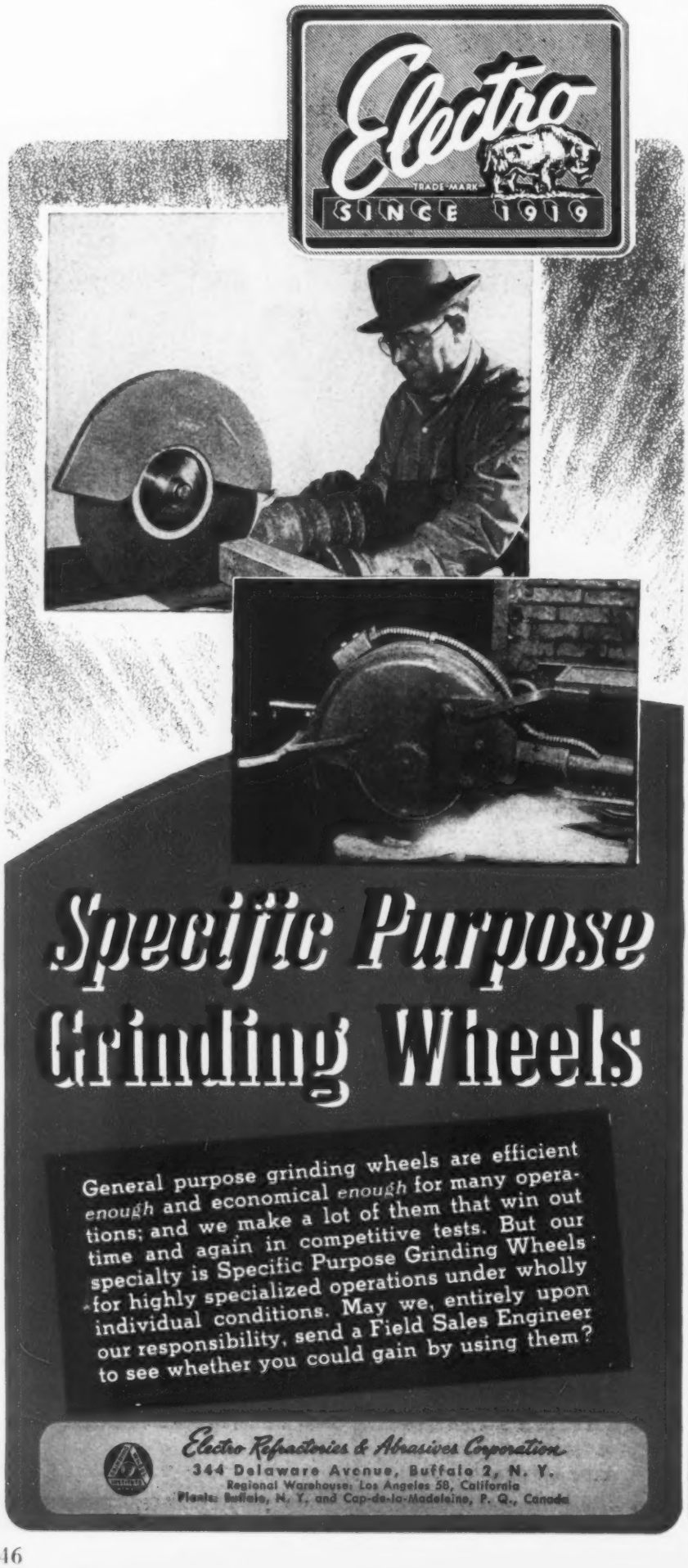
ALMCO SUPERSHEEN Dept. H-11 **MAIL COUPON NOW**
Albert Lea, Minnesota

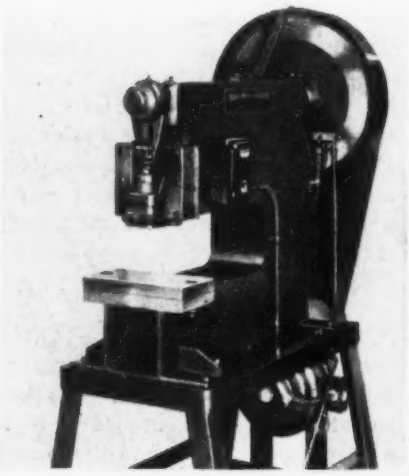
Send me the above 3 catalogs at once.

NAME

ADDRESS

CITY STATE

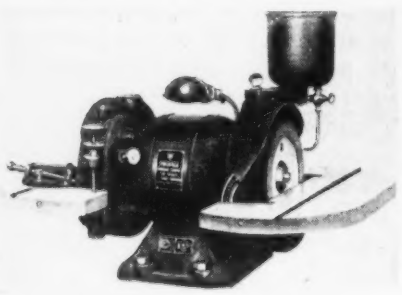

Electro
TRADE-MARK
SINCE 1919
Specific Purpose
Grinding Wheels
General purpose grinding wheels are efficient enough and economical enough for many operations; and we make a lot of them that win out time and again in competitive tests. But our specialty is Specific Purpose Grinding Wheels for highly specialized operations under wholly individual conditions. May we, entirely upon our responsibility, send a Field Sales Engineer to see whether you could gain by using them?
Electro Refractories & Abrasives Corporation
344 Delaware Avenue, Buffalo 2, N. Y.
Regional Warehouse: Los Angeles 58, California
Plants: Buffalo, N. Y. and Cap-de-la-Madeleine, P. Q., Canada



Deep throat press

New power punch press has a 24-in. throat depth and 2-in. stroke. It is equipped with a non-repeat clutch which, if desired, can be released for automatic feed. Capacity of the machine is 10 tons and it is rated at a speed of 175 strokes per min. Flywheel is in the rear permitting easier feeding of stock and giving the operator a greater margin of safety. *Whitney Metal Tool Co.*

For more data circle No. 32 on postcard, p. 135.



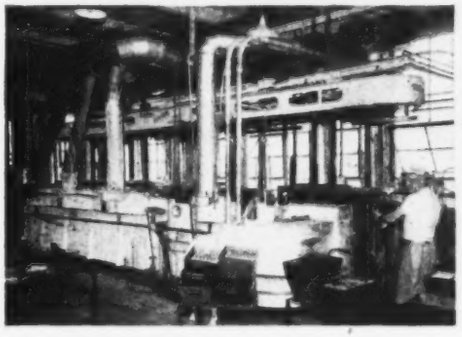
Carbide grinder

A new carbide tool grinder equipped with ½ hp motor and heavier shaft can be used with diamond, silicon carbide or aluminum oxide wheels, for roughing or finishing work on carbide, stellite, or high speed steel tools. Quick-acting index tables permit instant and accurate angle setting. Compensation for wheel wear permits use of virtually 100 pct of wheels. Several models and sizes for both wet and dry grinding are available. *Thomas Prosser & Son.*

For more data circle No. 33 on postcard, p. 135

Turn Page

PICTURE COURTESY OF MACK MOTOR TRUCK CORPORATION



Udylite Full Automatic Plating Machine is used at Ross Gear and Tool Company plant, Lafayette, Indiana.

UDYLITE EQUIPMENT ELECTROPLATES "REINS" FOR MODERN "MULES"

ROSS GEAR AND TOOL COMPANY USES UDYLITE EQUIPMENT TO PLATE STEERING GEAR PARTS FOR MACK TRUCKS

The old work mule has been put out to pasture, his place taken by powerful, rugged motor trucks which can go anyplace the mule could—and faster. Endurance is a premium with these huge vehicles—breakdowns cost money and precious time.

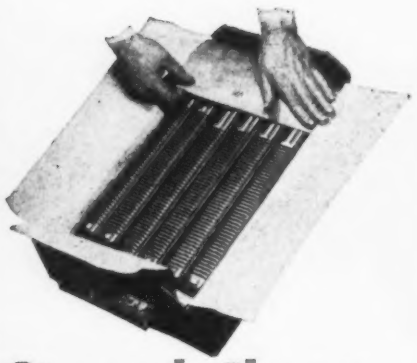
Moving parts in these modern "mules" must be protected against wear and tear with a surface as tough as the jobs these trucks must do. So Ross Gear and Tool Company, suppliers of steering gears for Mack Motor Truck Corporation, plates cams and bearing races with Udylite methods and machines. This assures a uniform finish at minimum cost in materials and manpower . . . and prevents surface scoring of these vital parts.

Ask your Udylite Technical Man about other examples where Udylite is helping build better, longer-lasting products. Or write direct to *The Udylite Corporation, Detroit 11, Michigan,* for complete details on how Udylite can help your firm in metal finishing operations.

PIONEER OF A BETTER WAY IN PLATING . . .

TESTED SOLUTIONS • TAILORED EQUIPMENT
AUTOMATIC CONTROL IN METAL FINISHING

THE Udylite CORPORATION
DETROIT 11, MICHIGAN



Stored Clean to Stay Clean

Here's one of a dozen or more ways you can use VPI to store parts without the bother and cost of slushing or dipping with oil.

The beauty of it is, you have no "cleaning" to do. Parts in-process or parts for inventory are *stored* clean. They *stay* clean and rust-free—always ready for instant use.

VPI gives off a vapor. It robs air and moisture of all corrosive action.

VPI Wrap may be used as a liner for tote pans (see above), drawers or boxes, as a package insert or in envelope form.

Reports of savings from VPI users are so revealing that typical examples have been compiled for you. Send today for your copy.

Angier VPI* WRAP

Angier

Distributors in All Principal Cities

Angier Corporation, Framingham 10, Mass.
Send "VPI Facts" as applied to:

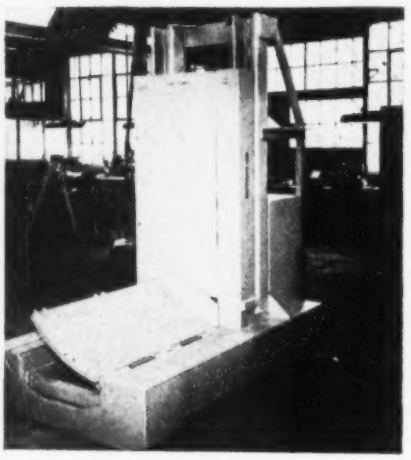
- ☐ Machinery-Industrial, Metal Working, Farm, Office, Construction.
- ☐ Electrical Machinery, Appliances, Products.
- ☐ Transportion Equipment — Auto, Aircraft, Naval, Railroad, etc.
- ☐ Fabricated Products — Cutlery, Hardware, etc.
- ☐ Steel in process of fabrication.
- ☐ Ordnance Equipment.
- ☐ Instruments and clocks.
- ☐ Other.

Sign below; attach to your letterhead

* ® Vapor Rust Preventive

New Equipment

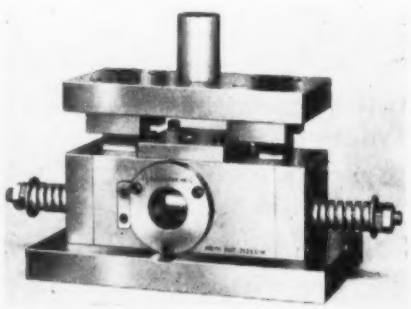
Continued



Coil stacker

With a lifting height of 27 in., a side-tilt concave platform 44 in. long x 24 in. wide, this electro-hydraulic coil lifter was designed to minimize time and manpower handling rolls of strip steel ranging from 24 to 56 in. diam. When a coil must be removed, operator presses push-pull handle which controls side discharge; strip steel is picked up at floor level by waiting fork truck with ram attachment. There is a sliding stop for tilting platform. Capacities can range from the smaller 1000-lb to the larger 8 to 10-ton models. *Lewis-Shepard Products, Inc.*

For more data circle No. 34 on postcard, p. 135.



Pipe notcher

The time required for notching pipe and tube ends is said to be reduced to about 3 sec, using a new Vogel Arc-Fit pipe and tube notcher. The tool, for use with a punch press, notches both sides of the pipe end with a single stroke. Cutting is from inside out. *Vogel Tool & Die Corp.*

For more data circle No. 35 on postcard, p. 135.

Turn Page

"Jeepers! That putter of Mac's is as accurate as a

Logan No. 955
QUICK CHANGE GEAR LATHE
11" Swing, 1" Collet
Capacity, 1⅜" Spindle Hole

Logan LATHE!"

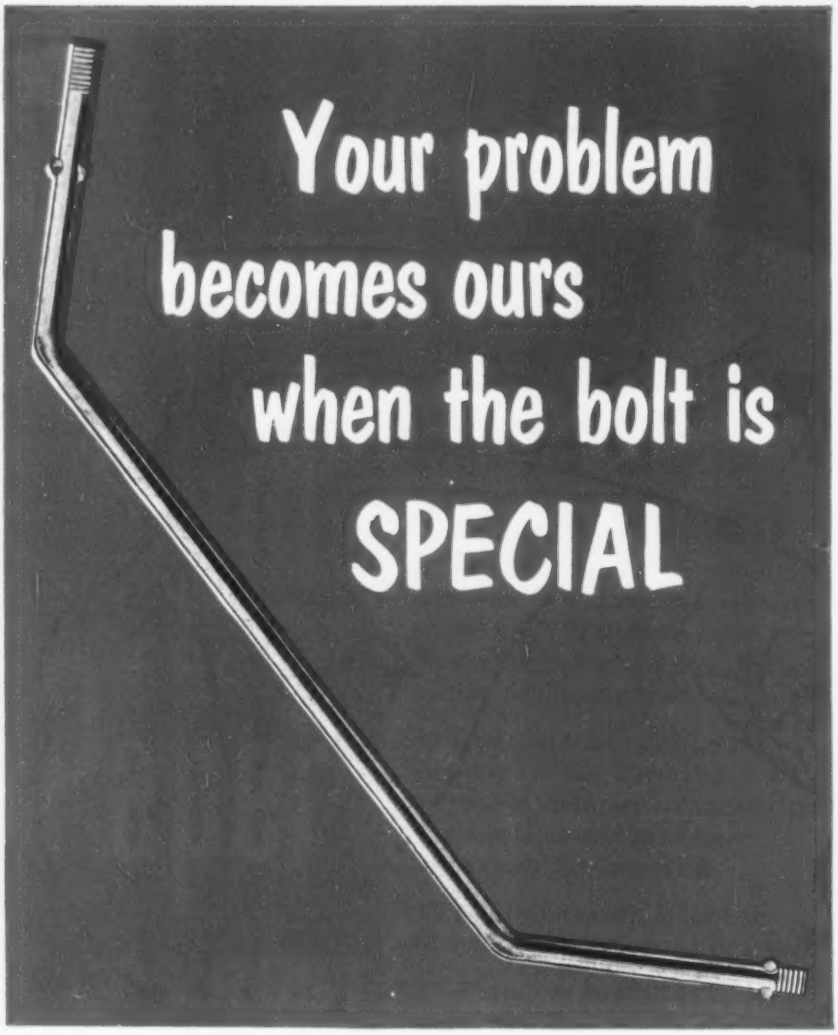
PRECISION RESULTS have made the Logan Lathe one of the world's most widely used machine tools. Logan advanced design and rugged, precise construction assure accuracy that stands up under hard daily use. Because the Logan ball bearing spindle, for example, needs no adjustment for any speed from 45 to 1500 rpm, original accuracy is preserved. The two V-ways and two flat ways of the Logan bed are precision ground to a tolerance of .0005", and are warp-free. 11" swing, 1" collet capacity and 1⅜" spindle hole provide the capacity for a high percentage of any shop's metal turning. Important, too, is the fact that no other lathe of comparable specifications can match the Logan in economy.

Visit your Logan Lathe dealer or write for the Logan Lathe and Shaper Catalog

LOOK TO LOGAN FOR BETTER LATHES AND SHAPERS

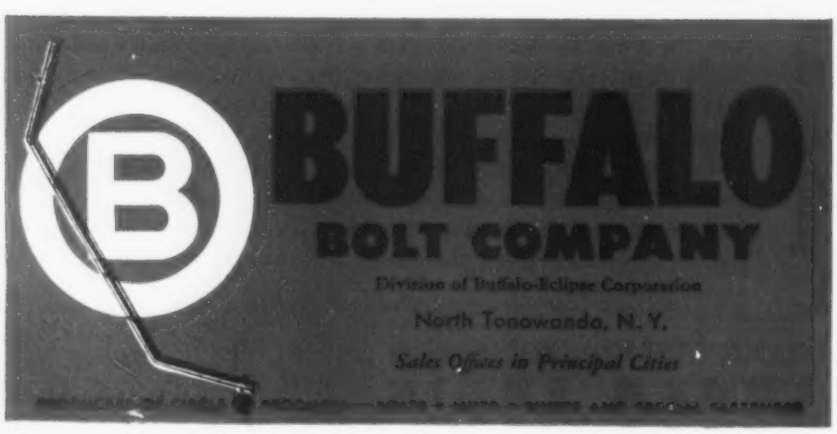
LOGAN ENGINEERING CO.

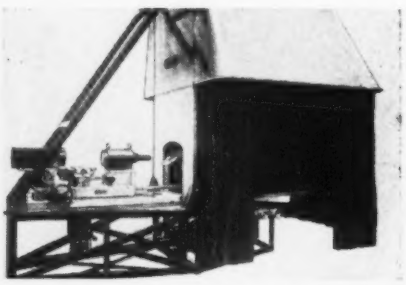
4901 West Lawrence Avenue, Chicago 30, Illinois



● Why limit the design of your products to an ordinary fastener? When you order Circle Ⓑ bolts, specially designed for your job, you can produce a better product...often at a saving. Let us work out your fastener problems. You'll save time and money...as well as headaches.

● For all of your fastener requirements, you'll find our new NO. 51 catalog a real help in specifying and ordering. Let us send you a copy.

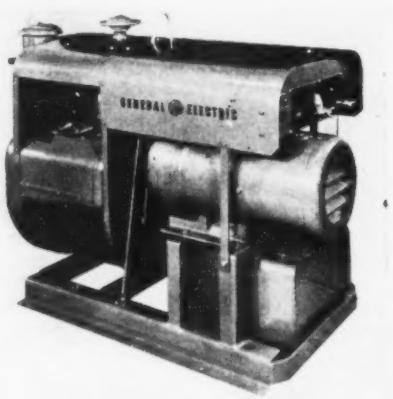




Contour projector

With a new Taylor-Hobson 200-in. profile projector, work up to 6 in. diam can be shown on a 60-in. screen. Tracings or templates can be mounted conveniently on the viewing table under which remote control for all adjustments are provided. Two sets of optics give 20X to 100X magnification for work to 3-in. diam; 10X magnification for work up to 6 in. *Engis Equipment Co.*

For more data circle No. 35 on postcard, p. 135.

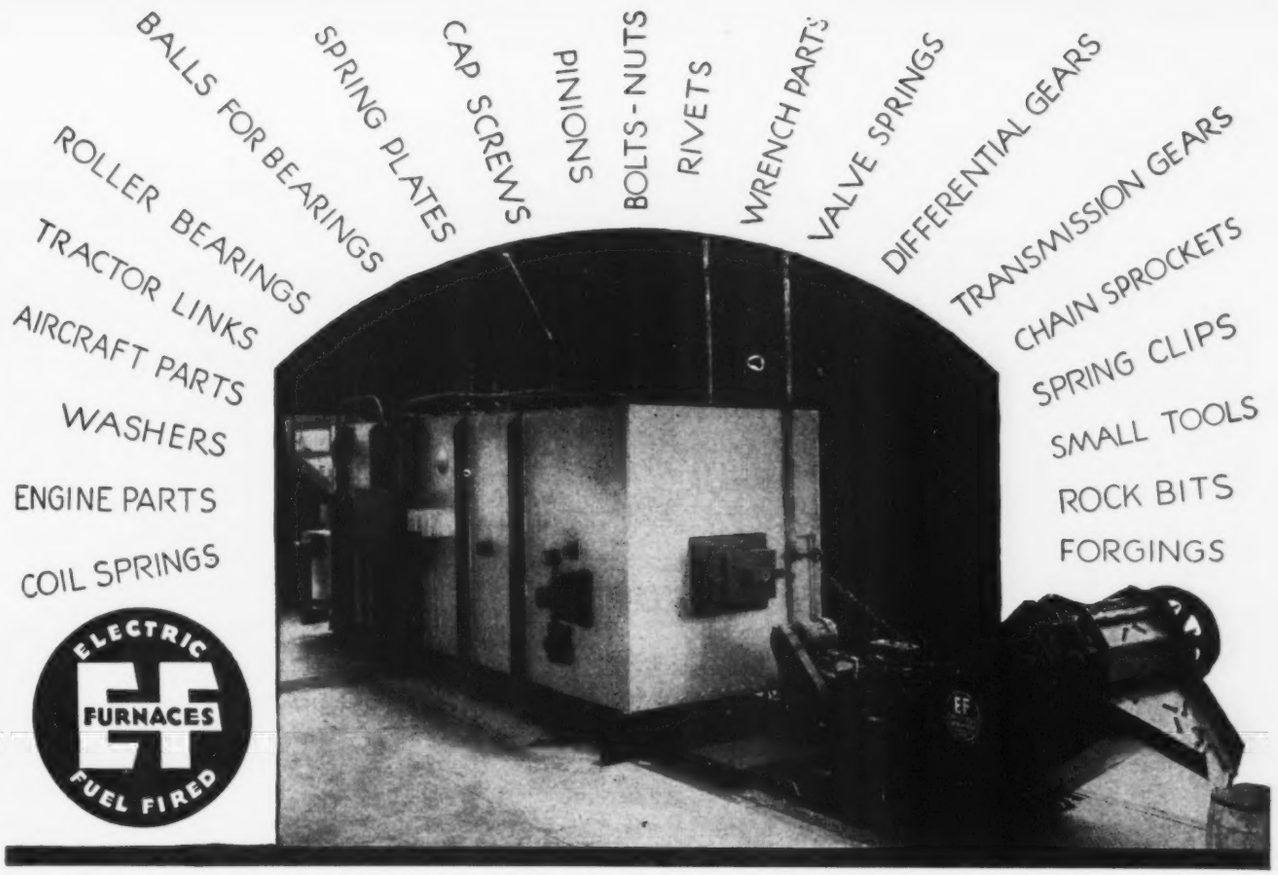


Engine-driven welder

New engine-driven dc arc welder with 60 pct duty cycle has a current range of 40 to 250 amp. It can be used with a variety of electrode sizes for repair, maintenance, and construction work. Consisting basically of a GE type WE42 generator and a Wisconsin air-cooled engine, it is designed to fit crosswise in a standard pickup truck. Optional equipment includes a trailer equipped with fittings for pressure lubrication. Forced ventilation keeps internal temperature within safety limits when the welder is operated on a 60 pct duty cycle at rated load. *General Electric Co.*

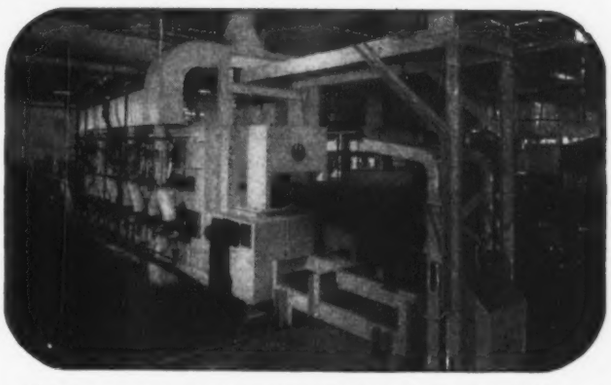
For more data circle No. 37 on postcard, p. 135

Turn Page



For Hardening Small Parts

Uniformly—Scale-free—Continuously 175 to 2000 lbs. per hour



EF Chain Belt Conveyor Furnace, Radiant Tube Gas Heated, Showing Labor-Saving Loading Arrangement. (View at Top) Electrically Heated Furnace Showing Automatic Quench and Discharge.

The EF Chain Belt Conveyor Furnace is one of the most satisfactory continuous heating units yet devised for scale-free hardening, carbon restoration and non-decarb heat treating small and medium size parts. The material is loaded onto a rugged heat resisting cast link conveyor belt; carried through the furnace; heated uniformly to proper temperature; automatically quenched and discharged. No pans or trays are needed. Hundreds in daily operation prove the dependability and efficiency of our design. 11 standard sizes. Capacities to 2000 lbs. or more per hour. Gas, oil or electrically heated. Furnished complete with any desired feeding or discharging equipment. Write for folders describing our chain belt or other production furnaces.

Gas-Fired, Oil-Fired EF and Electric Furnaces
for any Process, Product or Production
THE ELECTRIC FURNACE CO.
WILSON ST. at PENNA. R. R. *Salem - Ohio*

Canadian Associates • CANEFCO LIMITED • Toronto 1, Canada

where fine gears are produced

efficiently • economically!

● At Fairfield, YOUR GEARS are in the hands of specialists equipped with every modern facility for producing fine gears EFFICIENTLY, ECONOMICALLY. By specializing exclusively in "Fine Gears Made to Order" for more than thirty years, Fairfield has become one of America's largest producers of these parts. This is why many makers of construction machinery... agricultural implements... machine tools... military equipment... tractors, trucks, and buses now regularly depend on Fairfield to meet their requirements. *For the Best in Gears, Specify Fairfield.*

Right—Entrance to offices of Fairfield's new plant in Lafayette, Indiana.
Above—Hobbing Spur Gear.

FAIRFIELD MANUFACTURING CO.
2319 So. Concord Road, Lafayette, Indiana

for FINE GEARS

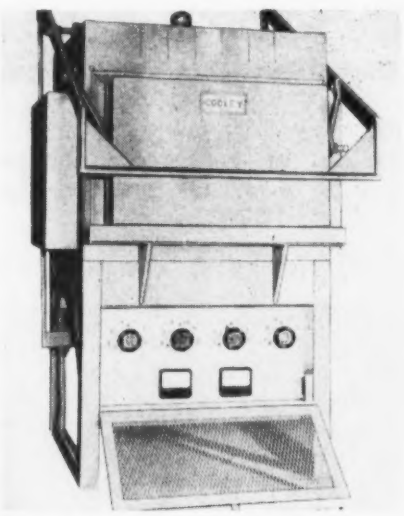
—New Equipment —

Continued

Hardening furnaces

Three models in a new line of electric high speed tool steel hardening furnaces cover operating temperatures of 1650° to 2500°F. Control of power is accomplished by use of multiple-tap transformers arranged for select voltages to be applied to the Globar heat elements located at the top and bottom of the chamber. Tap changing switches and ammeters are placed at the front of the furnace for operator convenience. Temperatures are controlled by a standard pyrometer arrangement. Furnace is heavily insulated by high temperature refractories. Size and thickness of front door make it virtually a moving front wall which gives unusual thermal efficiency. *Cooley Electric Mfg. Corp.*

For more data circle No. 38 on postcard, p. 135.



Die lubricant

A new drawing compound Metalloid X-60, is said in several installations to be increasing production up to 8 times per die dressing by limiting heat generated that causes welding and pickup on the dies. Active ingredients in Metalloid unite with the atoms in the workpiece to normalize the stressed section. Due to the absence of pigment in the material X-60 will not deposit gum on presses or ways. Corrosion problems are eliminated as the material does not break down and has a pH of 7. *Metalloid Corp.*

For more data circle No. 39 on postcard, p. 135.

CONTINENTAL

SHOP ASSEMBLY OF A 46" BLOOMING-SLABBING MILL AND 56" TANDEM COLD STRIP MILL AT EAST CHICAGO PLANT

Complete Rolling Mill Installations

SLABBING MILLS	Mills complete with Auxiliary Equipment	BLOOMING MILLS
UNIVERSAL MILLS		STRUCTURAL MILLS
PLATE MILLS	★ ★ ★	RAIL MILLS
HOT STRIP MILLS	CONTINENTAL CHIPPER	BILLET MILLS
COLD STRIP MILLS	ROLL LATHES	ROD MILLS
TEMPER MILLS	SPECIAL MACHINERY	MERCHANT MILLS

CASTINGS—carbon and alloy steel from 20 to 250,000 pounds

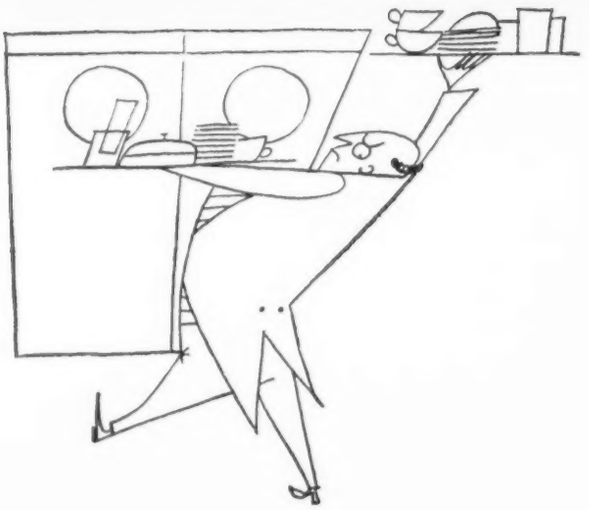
ROLLS—iron, alloy iron and steel rolls for all types of rolling mills

WELDMENTS—fabricated steel plate, or cast-weld design.

Plants at
East Chicago, Ind. • Wheeling, W. Va. • Pittsburgh, Pa.

CHICAGO • PITTSBURGH

CONTINENTAL
Foundry & Machine Company



want speedy service on special steels?

If you need a specialty steel in a hurry, put in a call to Crucible. All our warehouses have good stocks of our more than 400 steels. For instance, if you want one of our famous tool steels, you'll find a complete line to choose from.

With Crucible warehouses strategically located all over the country, you won't have to wait for delivery. Call the one in your neighborhood today.

Stocks maintained of:
Rex High Speed Steel . . . ALL grades of Tool Steel (including Die Casting and Plastic Die Steel, Drill Rod, Tool Bits and Hollow Drill Steel) . . . Stainless Steel (Sheets, Bars, Wire, Billets, Electrodes) . . . AISI Alloy, Max-el Machinery, Onyx Spring and Special Purpose Steels

CRUCIBLE first name in special purpose steels

52 *years of* Fine *steelmaking* **WAREHOUSE SERVICE**

CRUCIBLE STEEL COMPANY OF AMERICA, GENERAL SALES OFFICES, OLIVER BUILDING, PITTSBURGH, PA.

Branch Offices and Warehouses: ATLANTA • BALTIMORE • BOSTON • BUFFALO • CHARLOTTE • CHICAGO • CINCINNATI • CLEVELAND DENVER • DETROIT • HOUSTON • INDIANAPOLIS • LOS ANGELES • MILWAUKEE • NEWARK • NEW HAVEN • NEW YORK • PHILADELPHIA • PITTSBURGH PROVIDENCE • ROCKFORD • SAN FRANCISCO • SEATTLE • SPRINGFIELD, MASS. • ST. LOUIS • ST. PAUL • SYRACUSE • TORONTO, ONT. • WASHINGTON, D. C.

The Iron Age

SALUTES

Philip H. Marfuggi

This former athlete works for sound industrial relations by never being too busy to listen.

IN the course of an ordinary work day recently, Phil Marfuggi listened intently to a worried plant sweeper whose teen-aged daughter had lost interest in school, to an apprentice steel cutter who wanted to become a salesman, and to top company and union officials negotiating a new contract.

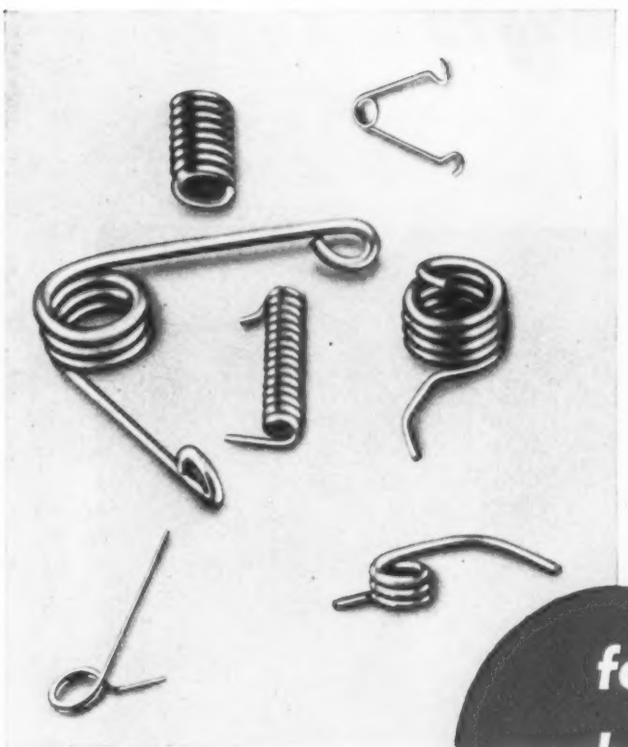
Phil, Lionel Corp. vice-president and manager of industrial relations, showed the same quick friendly interest to each. In the 15 years he's been with the firm he's gained the confidence of all employees, and his open door policy gets grievances settled quickly.

There's only been one strike at Lionel since Phil joined the company, and that one of the friendliest on record anywhere. Management and labor agreed to disagree, drew up rules of conduct, and came up with a mutually satisfactory settlement in 10 days of amiable negotiation. Many employee benefits were either started or expanded through Phil's first hand observations.

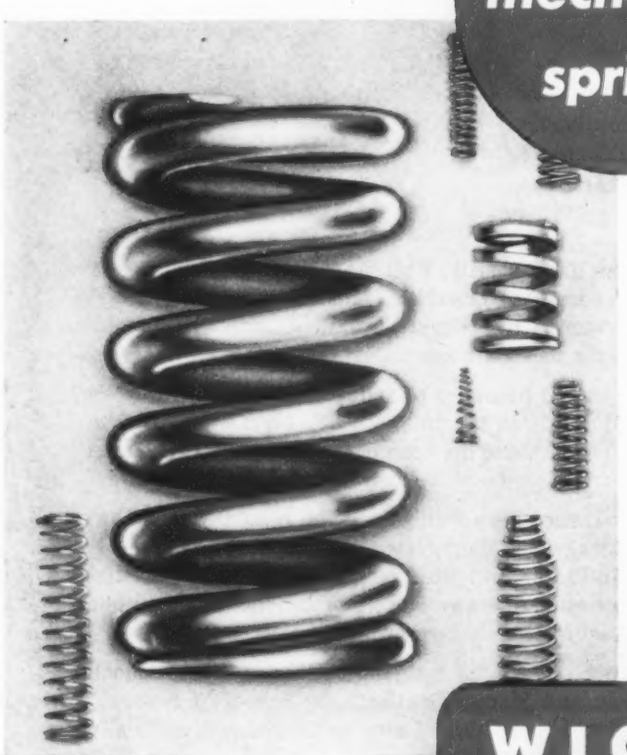
Phil's always liked being active. A graduate of East Orange High School, Catholic University of Washington, and Mercer-Beasley Law School of Newark, N. J., he was prominent in football and wrestling. Later he fought professionally in over 200 bouts.

An avid reader, Phil's most prized possession is the library in his Maplewood, N. J., home. Football is his favorite sport, especially when Army plays. He's a fine amateur chef, but for real enjoyment he likes just to "shoot the bull" with his many friends.

WICKWIRE WIRE



for mechanical springs



When you select Wickwire Wire you're always sure of wire that has the definite physical properties best suited for your particular spring application.

That's because Wickwire Wire . . . Hard Drawn, Spheroidized or Oil Tempered . . . is a product of long experience, skilled craftsmanship and completely integrated facilities starting with actual steel making. Thus, every step of its production is under constant and uninterrupted control, subject to thorough-going testing, checking and inspection.

High or low carbon steel . . . round or shaped . . . in all tempers, grades and finishes, it pays to remember—*For the Wire You Require, Check First With Wickwire.*

THE COLORADO FUEL AND IRON CORPORATION—Denver, Colorado
THE CALIFORNIA WIRE CLOTH CORPORATION—Oakland, California
WICKWIRE SPENCER STEEL DIVISION—Atlanta • Boston • Buffalo
Chicago • Detroit • New York • Philadelphia

WICKWIRE WIRE

PRODUCT OF WICKWIRE SPENCER STEEL DIVISION
THE COLORADO FUEL AND IRON CORPORATION

CF&I

The Iron Age

INTRODUCES

Andrew E. St John, elected president, ALLOYS & PRODUCTS, INC., New York; **C. A. Hecht**, elected vice-president, and **Wilson Hecht** was made a member of the board of directors. Mr. St. John succeeds Henry Hecht, deceased.

Neil A. Moore, elected president and a member of the board of directors, F. L. JACOBS CO., Detroit.

Harold C. Conners, appointed assistant to the president, GRAVER TANK & MFG. CO., INC., East Chicago, Ill.

John S. Conway, named vice-president in charge of sales, KOEHRING CO., Milwaukee; and **John E. Chadwick**, made sales manager.

Dale W. Patrick, appointed vice-president in charge of sales, Colona Mfg. Div., PITTSBURGH SCREW & BOLT CORP., Pittsburgh.

Arnold E. Johnson, elected a vice-president, INTERNATIONAL HARVESTER CO., Chicago, and **Harold B. Myers**, elected comptroller.

Harlan T. Pierpont, Jr., elected vice-president, Refractories Div., NORTON CO., Worcester, Mass.

Robert T. Dunlap, and **Hal A. Kroeger**, elected directors, GERITY-MICHIGAN CORP., Adrian, Mich.; and **T. Cary Thompson, Jr.**, elected secretary. He succeeds **John F. Langs**, who will continue as general counsel and a director.

Richard P. Seelig, named executive vice-president, CHROMALLOY CORP., New York.

Dwight Richards, appointed director of engineering, OLIVER UNITED FILTERS, INC.

Robert R. Wilke, appointed head, Electrochemical Div., ATLANTIC RESEARCH CORP., Alexandria, Va.; and **Forrest P. Clay, Jr.**, named research physicist.

Lynn C. Davenport, elected vice-president in charge of operations, MERCER TUBE & MFG. CO.

Robert L. Halsted, appointed manager, central region, ALLIS-CHALMERS MFG. CO. He succeeds **P. F. Bauer**, named general manager, Norwood Works, and manager of Apparatus Dept.

William D. Kent, appointed district sales engineer, THE INGALLS IRON WORKS CO., with headquarters in Houston.

R. E. Nelson, appointed production manager, AMERICAN GILSONITE CO., Bonanza, Utah.

M. R. Brice, appointed division manager, Industrial Control Sales, CUTLER-HAMMER, INC., Milwaukee.

Ray H. Timmons, appointed manager, Steam Div., WESTINGHOUSE ELECTRIC CORP., South Philadelphia, Pa.

Thomas E. Moffitt, appointed western manager, HOOKER ELECTROCHEMICAL CO., and **Horace W. Hooker, Jr.**, appointed western sales manager.

Andrew V. Chandler, appointed mid-eastern regional manager, DAVEY COMPRESSOR CO., Kent, Ohio.

Henry Hill, becomes consulting architect, GUNNISON HOMES, INC., a subsidiary of U. S. Steel.

J. A. Keek, named eastern district manager, Heavy Chemicals Dept., AMERICAN CYANAMID CO., New York; **E. J. Adams**, appointed southern district manager; and **W. H. Leon**, made western district manager.

Donald K. Bice, appointed sales manager, BILTMORE PRODUCTS CO., an associated company of Hankinson Corp., Pittsburgh.

JOSEPH P. SOMERS, appointed assistant to the president, Wyckoff Steel Co., Pittsburgh.

JAMES T. DUFFY, JR., elected executive vice-president, Camden Forge Co., Camden, N. J.

RICHARD S. NEWLIN, elected vice-president in charge of mining operations, Anaconda Mining Co.

Personnel

Continued

E. E. Valy, appointed distributor sales manager, ILLINOIS TOOL WORKS, Chicago, and **Andres L. Pontius**, appointed Shakeproof Div. works manager.

Emil Holzwart, appointed production manager, GENERAL BOX CO., Des Plaines, Ill. He succeeds D. F. Hahn, deceased.

Ray W. Warren, appointed southeast special representative, GALION ALLSTEEL BODY CO., Galion, Ohio.

William O. Murray, named industrial sales engineer, Pittsburgh headquarters, THE PARKER APPLIANCE Co.; and **Pete E. Walker**, appointed industrial sales engineer, in St. Louis.

F. P. Murken, appointed manager, Industrial Hose Div., QUAKER RUBBER CORP., division of H. K. Porter Co., Inc.

A. L. Fabens, Jr., appointed assistant general manager and production manager, Ramset Div., OLIN INDUSTRIES, INC.

Samuel K. Scovil, appointed assistant manager of ore sales, CLEVELAND-CLIFFS IRON CO., **Robert P. Probeckhas**, made manager, Tax Dept.; **Fred Gregory**, named fleet engineer; and **James H. Durkin**, named consulting engineer.

Charles F. Foster, joins Philadelphia district sales force, BULLDOG ELECTRIC PRODUCTS CO.; **Robert W. Daleen**, appointed field engineer, Kansas area; and **Leo H. Lipscomb**, appointed sales manager.

Howard J. Evans, appointed chief engineerfi ROCKWELL MFG. CO., Pittsburgh; and **Robert J. Sarraf**, appointed chief chemical engineer, Meter & Valve Div.

Charles W. Nulle, appointed advertising manager, Lighting Div., SYLVANIA ELECTRIC PRODUCTS, INC., New York.

Harry L. Bauer, named manager, THE McCARTHY CO., new Chicago offices.

RICHARD W. BANFIELD, elected a vice-president, Niles-Bement-Pond Co., West Hartford, Conn.

EMERY B. KEREKES, named assistant to the vice-president, Hydropress, Inc., and its subsidiary, The Loewy Construction Co., Inc. of New York.

ROY A. NOBLE, appointed supervisor of extruded and stainless products sales, U. S. Steel Co., National Tube Div.

W. L. NEWHALL, appointed director of the Dept. of Research & Development, Dravo Corp., and subsidiaries.

SEND FOR

WILMOT CONVEYOR BULLETIN 502

As Originators of Rivetless Chain, Wilmot Offers Widest Choice of Chain Sizes and Conveyor Attachments

The booklet contains engineering data on rivetless chain in pitches from 3" to 10½" and working loads from 3,000 to 130,000 lbs.; of drop-forged steel, alloy or cast chrome-manganese steels. Wilmot not only stocks the largest choice of chain sizes, but also furnishes the widest range of other conveyor parts: sprockets, traction wheels, flights, take-ups, shafting, bearings and trough in cast iron, ductile iron, carbon or chrome-manganese steel to fit the application. See why an increasing number of leading firms are cutting "down" time by depending on Wilmot for all conveyor replacement parts.

WILMOT ENGINEERING CO. HAZLETON, PA. *Foundry and Shops:* WHITE HAVEN, PA.

"SO THAT'S WHERE THOSE LITTLE PIGS WENT!"

CHIEF KEOKUK: Sure enough, dear! Thousands of Electro-Silvery pigs were melted down to help make the iron and steel for those skyscrapers . . .

PRINCESS WENATCHEE: . . . and wasn't Electro-Silvery used in making the metal for this boat we're on, and for tanks and tractors and automobiles?

CHIEF KEOKUK: Right! It's hard to find *any* type of product made of iron or steel that *doesn't* use Electro-Silvery!

CHIEF KEOKUK JR: Gosh, Pop, what *is* Electro-Silvery?

CHIEF KEOKUK: Electro-Silvery, son, is a form of ferro-silicon that acts as a vital control element in the production of iron and steel . . .

PRINCESS WENATCHEE: . . and the world's largest producer of this vital ingredient is the Keokuk Electro-Metals Company!

KEOKUK

ELECTRO-METALS COMPANY

KEOKUK, IOWA

WENATCHEE DIVISION: WENATCHEE, WASHINGTON

Keokuk Electro-Silvery is used by foundries and steel plants in the form of these three pigs, weighing 60 pounds . . . 30 pounds . . . and 12½ pounds.

SALES AGENTS: MILLER AND COMPANY

332 S. Michigan Ave., Chicago 4, Illinois

3504 Carew Tower, Cincinnati 2, Ohio

915 Olive St., St. Louis 1, Missouri

POWDERMET* SUCCESS STORY NO. 12

THE GEAR THAT COULDN'T BE MADE!

Designers specified powdered metal for this two inch helical gear to avoid the high cost of production by conventional methods. But the combination of helical gear teeth with the axial elements of the clutch collar presented an unusual problem in powdered metal fabrication.

That's why they came to Powdered Metal Products Corporation of America . . . the gears, made from a special bearing bronze in production quantities, cost less than fifty cents each!

Write today for complete information on the possibilities of POWDERMET* Gears, both standard and special.

sign of leadership PMP in powder metallurgy

POWDERED METAL PRODUCTS CORPORATION of America

9335 West Belmont Avenue,
Franklin Park, Illinois

*Trademark

—Personnel—

Continued

Howard Toncray, II, appointed Rocky Mountain States representative LINATEX CORP. OF AMERICA, Rockville, Conn.

George F. Shaver, appointed sales manager, PACIFIC AIRMOTIVE CORP., Seattle Branch, and **J. M. Craig, succeeds** Mr. Shaver as sales manager, in Burbank.

H. C. Cranfill, appointed assistant to the vice-president, operations, Columbia-Geneva Steel Div., U. S. STEEL.

Victor D. Kniss, appointed general sales manager of consumer products, WESTINGHOUSE ELECTRIC CO., Pittsburgh.

Theodore Skol, becomes assistant sales manager, ABBOTT SCREW & BOLT CO., Chicago.

H. L. Weinberg, appointed director of engineering, AMERICAN LOCOMOTIVE CO., Schenectady.

Carl E. Johnson, appointed chief engineer, SCAIFE CO., Oakmont, Pa.

J. C. Jamieson, appointed Pacific regional manager, Pontiac Motor Div., GENERAL MOTORS CORP., Pontiac, Mich.

OBITUARIES

George Ott, 83, founder and owner of the George Ott Boiler Co., Springfield, Ill., at his home, recently.

Harry Dobrin, 68, president of Furnace Engineers, Inc., Pittsburgh, recently. He was nationally known in the field of combustion engineering.

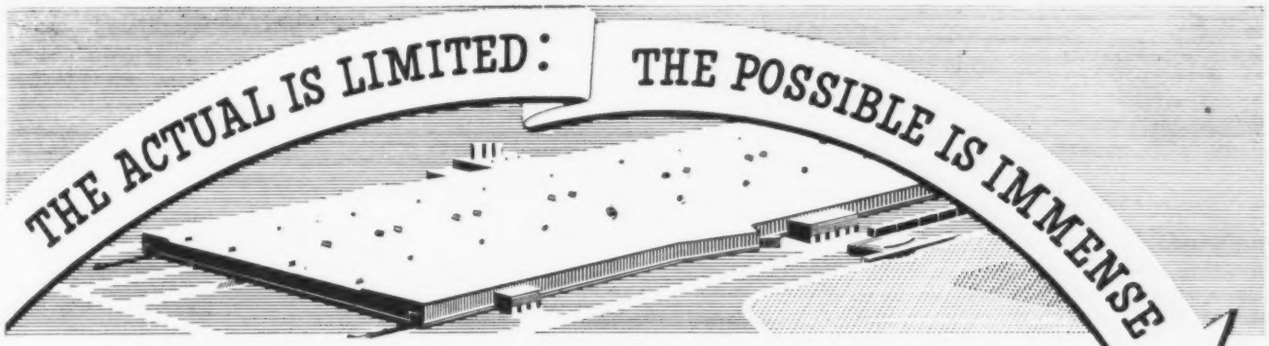
Earl M. Cummings, founder and senior partner, Cummings, Brand & McPherson Advertising, recently.

John T. Robbins, 50, a metallurgist and sales engineer, Peter A. Frasse & Co., Inc., New York.

James E. Loshbough, 81, well-known designer and manufacturer of presses and a founder of Federal Press Co., Elkhart, Ind., recently.

George G. Knecht, 68, district manager, Hanson-Van Winkle-Munning Co., Matawan, N. J., suddenly of a heart attack.

Leo Kulka, 55, assistant chief body engineer, Engineering Div., Chrysler Corp., suddenly.



NEW LINCOLN PLANT CREATED BY INCENTIVE-INSPIRED CO-ACTION IN DEVELOPING POSSIBILITIES IN PRODUCT

© LE Co. 1952

WELDED DESIGN PUTS RIGHT MATERIALS IN RIGHT PLACE TO SIMPLIFY PRODUCTION...CUT COSTS 57%

By **Hugo C. Klix,** Planning & Methods Supervisor
The Lipe-Rollway Corporation,
Syracuse, New York

IN redesigning the bar feed legs for our product, welded design provides a stronger, more durable construction yet one that can be produced from less material and at a 57% saving in cost.

The original design in gray iron (Fig. 1) entailed costly operations of machining and assembly. With our present welded steel design, the shop has simply to saw steel components to length from standard mill shapes. These components are then held in plain clamp-type fixtures and fillet welded with fast, downhand welding techniques.

The welded design also gives the shop greater flexibility of operation. Since patterns are no longer required, former maintenance and storage costs are eliminated.

Fig. 3. Bar Feed *of welded design manufactured by Lipe-Rollway Corporation, Syracuse, New York. Welded steel gives added strength and rigidity, has neater appearance.*

PROPER DESIGN IN WELDED STEEL IMPROVES PRODUCT LOWERS COST

Fig. 1. Machine Stand *originally made from gray iron used steel tube for column. Top and bottom members required milling and drilling. Weight, 54 pounds. Cost, $22.58.*

CUTS COSTS 57%

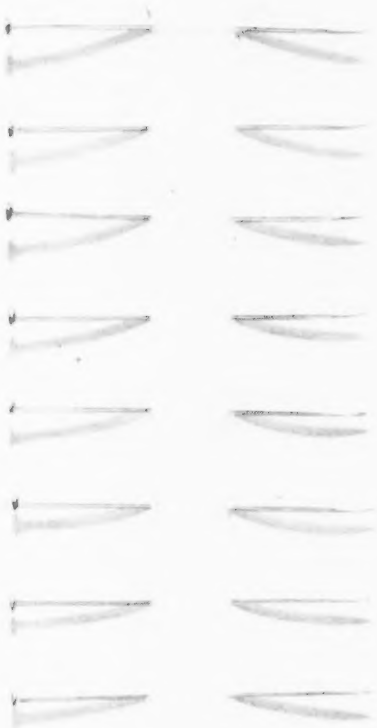
Fig. 2. Present Welded Steel Design *for maximum economy uses standard steel shapes whenever possible. Weight . . . only 47 pounds. Cost . . . $9.71 . . . a saving of $12.87 per unit.*

STRONGER, MORE RIGID PRODUCT

Machine Design Sheets available on request. Designers and Engineers write on your letterhead to Dept. 513

THE LINCOLN ELECTRIC COMPANY
Cleveland 17, Ohio

THE WORLD'S LARGEST MANUFACTURER OF ARC WELDING EQUIPMENT



Fabricators looking for
shipment-to-shipment
STEEL UNIFORMITY
have found it at
Inland.
The reason:
Raw materials come
from the same sources
and finished products
are rolled on the
same mills
by the same men.

INLAND STEEL COMPANY

38 South Dearborn Street • Chicago 3, Illinois

Sales Offices: Chicago • Davenport • Detroit • Indianapolis
Kansas City • Milwaukee • New York • St. Louis • St. Paul

AGE

the iron Age
FOUNDED 1855
Technical Articles

ALLOY TOOL STEELS WITH NITROGEN

Use of nitrogen as an alloying element in special steels has practically doubled tool life under certain conditions, Russian metallurgists claim. Nitrogen, which must be used with aluminum for best results, is reported to increase stability of austenite in the annealed, quenched, and in cold-worked high-chromium, high-nickel steels. Addition of 0.15 to 0.25 pct N replaces 4 to 5 pct Ni in the manufacture of austenitic steels. In austenitic high-carbon steels nitrogen is generally found in the carbide phase.

Recent Russian publications show a systematic attempt to use nitrogen in manufacture of some special steels as a means of conserving strategic materials and incidentally lowering manufacturing cost of these steels.

Following the customary preamble establishing the fact that the Russians pioneered the research on nitrogen in steel, the authors reveal the latest and most ambitious effort in this direction, and this effort appears to be quite noteworthy, even if the conclusions are taken with a grain of salt.

The first of the series of papers deals with nitrogen as an alloying element in high chromium and chromium-nickel steels. Contrary to Russian claims of originality in the use of nitrogen as an alloying element in stainless steels, some German research reported in 1940 has shown that the use of nitrogen in such steel lowers the nickel requirements for producing austenitic steels. The Russian research effort appeared to be, however, much more ambitious in scope than its German forerunners. Twenty-one experimental heats were made. The nitrogen was introduced by means of nitrided ferrochromium added to the melt. Heat treating tests, X-ray analyses, metallographic examination, as well as dilatometric and magnetic tests made on these steels led Prosvirin and Agapova to the following conclusions:

(1) Nitrogen increases the stability of austenite in the annealed, quenched, and in cold-worked high-chromium, high-nickel steels.

(2) Addition of 0.15 to 0.25 pct N replaces 4 to 5 pct Ni in the manufacture of austenitic steels.

(3) In austenitic high-carbon steels—more than 0.15 pct C—the nitrogen is generally found in the carbide phase.

Considerable more novelty, judging from published data, is found in the second paper of the monograph, dealing with nitrogen in low-tungsten tool steels. Sixty-four heats comprising four

Translated by S. L. Case, technical advisor, Battelle Memorial Institute, Columbus, Ohio, from a Russian book published by the Central Scientific Research Institute of Technology and Machine Construction, Moscow. V. I. Prosvirin was editor and senior author, assisted by junior authors Agapova, Ageiev, Oushevski, and Zudin.

"Nitrogen . . . combined with aluminum, raises the hardness stability of these steels . . ."

series of 16 heats each were made. Carbon content of all heats was aimed at 0.80 to 0.90 pct, while nitrogen was kept in the 0.1 to 0.2 pct range. In one series, chromium was the base alloying element 5 to 6 pct; in the second series, chromium was kept in the 5 to 6 pct range, and molybdenum within 1.3 to 1.5 pct limits was added; in the third series, chromium and tungsten were the base alloying elements (5 to 6 pct, and 4 to 5 pct, respectively); in the fourth series, chromium and vanadium were the major alloying elements (5 to 6 pct and 4 to 5 pct, respectively). Major variables in all groups were silicon, manganese, and aluminum.

Heat treating tests involving quenching and repeated tempering at various temperatures, were made on all steels. The series made with chromium and vanadium showed the highest hardness after quenching and repeated tempering at 550°C.

In the second phase of this investigation, 36 experimental melts were made in which the chemical composition was varied within the limits indicated in Table I.

Melts were made in an induction furnace. Weight of heats hanged from 2.5 kg or 12.5 kg (5.5-27.5 points). After stripping from the molds, the cylindrical hot-topped ingots were heated to 860° to 880°C, held at this temperature 2 hr, furnace cooled to 700° to 720°C, held at this temperature 3 hr, then furnace cooled to room temperature.

The annealed ingots were skinned on a lathe to eliminate surface defects and forged into round bars 22 mm ($^7/_8$ in.) in diam. These bars were then given the same heat treatment as the original ingots. Hardness of the annealed bars ranged from 180 to 220 Brinell. They were machined into specimens 20 mm by 200 mm (0.8 x 8 in.) for heat treating tests (hardness stability following repeated tempering) and tool-life machinability tests.

The tests demonstrated that in order to obtain maximum benefits from nitrogen, it was essential to have aluminum as an alloying element. This condition is illustrated graphically in Fig. 1 and 2 in which the changes in hardness resulting from repeated tempering at three different temperatures are shown for two steels (No. 6 and No. 7) the composition of which is given in Table II.

Cutting tools were made from a number of the experimental steels. The composition of these steels is given in Table III. Results of tool-life cutting tests are listed in Table IV. In all tests, the steel used for machining was of the SAE 1045 grade, normalized to a hardness of 190 Brinell. Cutting tests were run dry. Depth of cut was 2 mm (0.078 in.), feed was 0.2 mm (0.0078 in).

The general conclusions drawn from these and other tests are summarized as follows:

(1) Nitrogen as an alloying element in high-speed cutting steel, when combined with aluminum, raises the hardness stability of these steels under repeated tempering treatments.

(2) Nitrogen decreases the depth of the columnar zone in tool steel ingots.

(3) Nitrogen-bearing low-tungsten, chromium-vanadium tool steels (such as steels 30, 31, and

TABLE I

COMPOSITION VARIABLES IN EXPERIMENTAL MELTS

Element	Variation, Pct
Carbon	0.76 - 1.72
Silicon	0.12 - 2.43
Manganese	0.25 - 1.23
Chromium	3.28 - 11.00
Vanadium	1.29 - 3.55
Tungsten	0.0 - 3.78
Aluminum	0.0 - 3.20
Nitrogen	0.0 - 0.28
Phosphorus and Sulfur	< 0.030

TABLE II

ANALYSIS OF STEELS USED FOR HARDNESS-STABILITY TESTS

Steel Identification	Chemical Composition, Pct							
	C	Mn	Si	Cr	Al	N	P	S
No. 6	0.86	0.27	0.30	5.06	3.2	0.21	0.026	0.022
No. 7	0.89	0.25	0.30	5.15	0.0	0.05	0.025	0.024

TABLE III

COMPOSITION OF EXPERIMENTAL STEELS USED FOR TOOL-LIFE TESTS

Steel Identification	Chemical Composition, Pct							
	C	Mn	Si	Cr	V	W	Al	N
11	1.04	0.35	0.14	4.91	1.52	.....	0.53	0.02
12	0.86	0.37	0.18	5.02	1.29	.....	0.51	0.02
13	1.05	0.38	0.36	4.91	1.33	.....	0.51	0.02
23	1.03	0.40	0.31	5.14	2.50	.....	0.98	0.28
24	1.09	0.38	0.30	4.99	1.95	.....	1.40	0.05
28	1.55	1.22	0.36	6.55	3.55	.....	1.14	0.07
29	1.47	1.18	0.59	6.32	3.50	.....	1.31	0.07
32	1.53	0.81	1.03	6.22	3.30	.....	0.64	0.05
30	1.45	0.96	0.51	8.50	3.41	.....	1.34	0.09
31	1.32	0.96	0.54	10.31	3.45	.....	1.27	0.06
14	0.86	0.38	0.12	4.88	1.52	1.86	0.30	0.08
15	0.99	0.40	0.23	4.89	1.52	2.76	0.30	0.09
16	0.92	0.38	0.21	4.79	1.92	3.61	0.71	0.07
33	1.74	0.96	0.78	8.70	3.10	1.32	1.34	0.09
34	1.59	1.03	0.86	8.01	3.37	2.63	1.29	0.09
35	1.72	0.68	0.43	4.67	2.70	3.78	0.50	0.05
36	1.49	0.56	0.91	11.00	3.43	3.41	1.78	0.05

TABLE IV

LATHE TOOL-LIFE TESTS ON NITROGEN-BEARING STEELS

Steel Group	Identification of Steels	Cutting Speed Meters Per Min For a Tool-Life of 60 Min	Relative Productivity Index
Tungsten-free steels	11, 12, 13, 23, and 24	.....	56
Tungsten-free steels with increased C, Mn, and Cr content	28, 29, 32 30, 31	34 43	57-60 72-77
Low-tungsten steels	14, 15, 16	47	79-84
Low-tungsten steel with increased Cr and Mn	33, 34 35	43 52	72-77 87-92
Conventional high-speed tool steel 18 Pct W		56-60	100

TABLE V

COMPOSITION OF STANDARD U.S.S.R. TOOL STEELS

Steel Designation	Chemical Composition, Pct					
	C	Mn	Si	W	Cr	V
184	0.80	0.36	0.38	4.47	7.48	1.0
262	0.85	0.39	0.39	8.57	4.10	2.45

35) can satisfactorily replace conventional high-tungsten tool steels when the cutting speed need not exceed 115-130 fpm.

The third paper reports results of tests made on introducing nitrogen in standard U.S.S.R. tool steels. In the preparation of experimental steel, millings were prepared from these standard steels and nitrided in ammonia gas. The nitrided millings contained up to 4.5 pct nitrogen. These millings were then added to induction-furnace melts of the standard alloys, thus introducing nitrogen without changing the basic composition of these steels. The two U.S.S.R. tool steels used

TABLE VI

EFFECT OF NITROGEN ON TOOL LIFE OF LOW TUNGSTEN TOOL STEELS

Experimental Tool Steel	Cutting Speed For a 60-Min Tool Life		Relative Tool Life (in Min) at Constant Cutting Speed	Improvement in Tool Life Attributable to Nitrogen
	Meters/Min	Ft/Min		
262 Standard	30.0	.....	13*	
262 with 0.09 Pct N_2	32.8	.....	30*	230 Pct
184 Standard	8.5	.....	22**	
184 with 0.09 Pct N_2	10.3	.....	70**	318 Pct

* Tool life at a cutting speed of 35 m min.
** Tool life at a cutting speed of 10 m min.

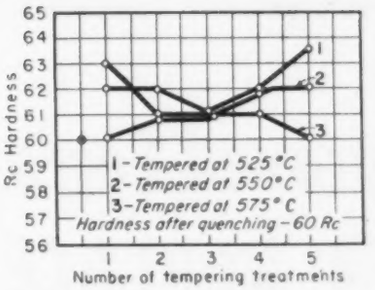

Rc Hardness
Number of tempering treatments
1 - Tempered at 525 °C
2 - Tempered at 550°C
3 - Tempered at 575° C
Hardness after quenching - 60 Rc

FIG. 1—Effect of repeated tempering on hardness stability of steel sample No. 6 quenched from 1275° C. Hardness after quenching is Rc 60.

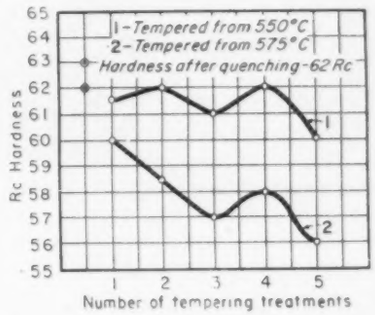


FIG. 2—Effect of repeated tempering on hardness stability of steel sample No. 7 quenched from 1250° C. Hardness after quenching is Rc 62.

in these tests were 184 and 262, with analysis shown in Table V.

When nitrided millings were added to these melts, the nitrogen content of the ingots ranged from 0.30 to 0.40 pct. However, during forging and subsequent heat treatment about 75 pct of this nitrogen was eliminated and the residual nitrogen reached a fairly stable value of roughly 0.090 pct. The specimens forged satisfactorily. Initial forging temperature was 1150°C; final temperature at the end of the operation was about 950°C. Nitrogen apparently raised the austenitic grain coarsening temperature of the tool steels thus making them less sensitive to overheating during hot-working. Nitrogen also increased the amount of residual austenite after heat treatment.

Most significant was the effect of nitrogen on tool life of standard tool steels. Lathe turning tests were made on single-point tools without the use of a coolant. The cutting was performed on a ball-bearing steel of the composition: 0.98 pct C, 0.38 pct Mn, 0.12 pct Si, 1.6 Cr, 0.02 pct P, 0.008 pct S. This steel was heat treated to a hardness of 415-420 Brinell. The depth of cut was 0.039 in. and the feed 0.0187 in.

Effect of nitrogen on tool life as indicated by these tests is shown in data summarized in Table VI. If the results of tests reported by Prosvirin and Oushevski are taken at face value, use of nitrogen as an alloying element in tool steel may have significant economic importance, since tool life was practically doubled under the conditions of the tests.

Favorable strength comparisons—

Improved Ferritic Steel CAN REPLACE AUSTENITIC STEEL

By Joe Gin-Young Chow and D. W. Kaufmann

Metallurgist, Harrison, N. J.

Metallurgist, Crucible Steel Co. of America, Pittsburgh

A ferritic steel containing approximately 13 pct Cr has proven suitable for service somewhat above 1000° F. Strengths compare favorably with austenitic stainless steels at 1000° F. High ductility is maintained at elevated and room temperatures after long periods of exposure. Steel is not weakened by sharp notches at 1000°, 1100° and 1200° F. Outstanding properties are obtained with a minimum of strategic metals.

At temperatures above 1000°F where high strength is important, ferritic steels have been generally regarded as unsatisfactory. Austenitic steels are stronger at temperatures of 1200°F and higher and should be used for long-time service at these temperatures. However, for applications involving a maximum temperature of between 1000° and 1200°F, the choice of steels has not been so clear cut.

If a suitable ferritic steel was available, the design engineer would no doubt prefer it because of its lower cost and the wide range of mechanical properties at room temperature obtainable by heat treatment. Furthermore, the ferritic steels have several other advantages over the austenitic types, including lower thermal coefficient of expansion, better thermal conductivity and higher damping capacity. Processing engineers would welcome ferritic material because of its better machinability and and the possibility of using magnetic particle inspection methods. Conservation of strategic alloys is also a big factor in favor of the ferritic grades.

A satisfactory ferritic steel for service above 1000°F should include the following characteristics: 1. Stress rupture and creep strength at least equivalent to those of the austenitic steels at 1000° and 1100°F; 2. Reasonable structural stability; 3. Adequate scale resistance at intended service temperatures; 4. Maintenance of good ductility at service temperature and at room temperature subsequent to a long period of service; 5. High notched stress-rupture strength at service temperatures; 6. Good combination of room temperature strength and ductility obtainable by heat treatment.

Development of an improved ferritic material at the Research Laboratory of Crucible Steel Co. of America was at first based on 2.5 pct Cr steels with additions of V, W, Mo and B. The original objective was an improved bolting steel. Because the bolting specification requires 105,000 psi minimum .2 pct yield strength, and 125,000 psi minimum tensile strength at room temperature, these steels were tested in the hardened and tempered condition. They developed surprisingly high strength at 1000° and 1100°F. However, they became quite brittle after a few hundred hours exposure at these temperatures.

Work at the University of Michigan[1] on low alloy ferritic turbine disks indicates that this

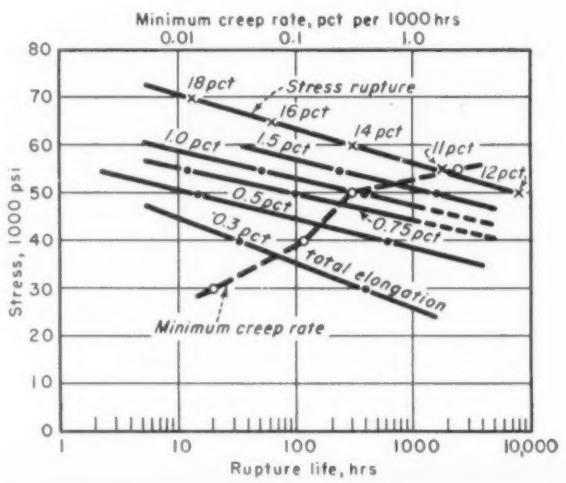


FIG. 1—Design curves, Crucible 422, 1000°F. Heat Treatment: Oil quenched from 1900°F, tempered at 1200°F—2 hrs.

class of material heat treated to high strength levels has low ductility at 1100°F. The formation of a flaky scale at 1100°F which indicates inadequate scale resistance further discouraged additional work by Crucible on the 2.5 pct Cr steels for high temperature service.

Emphasis was then shifted to 12 pct Cr ferritic alloys and Crucible 422 was developed. It has the following nominal composition: C 0.20, Ni 0.70, Cr 1300, V 0.30, W 1.00 and Mo 1.00.

Generally, 422 is a modification of Type 420, the carbide forming elements V, W, and Mo being added as strengtheners. Carbon functions as an austenite former, allowing the steel to be heat treated to desired strength. The small amount of nickel adds to the effect of carbon in controlling the formation of austenite. Carbon also contributes strengthening effects by the precipitation of alloy carbides on tempering.

Vanadium, tungsten and molybdenum are added primarily as strengtheners. Of the three, vanadium appears to be the most effective. However, increasing vanadium above about 0.3 pct did not further increase the strength at elevated temperatures. The three alloys provide the steel with good resistance to tempering which will be shown later to influence markedly the strength of 422 at elevated temperatures. Molybdenum also seems to maintain high toughness in the steel.

The main function of chromium is providing scale resistance. For long time service at temperatures above 1000°F, 12 pct Cr is about the minimum that would provide the necessary scale resistance. Much higher Cr content is to be avoided to prevent development of various types of embrittlement.

Effects of heat treatment on the room temperature properties of 422 are presented in Table 1. Generally, this steel, tempered at temperatures between 1150° and 1350°F for 2 hr, has a good combination of strength and ductility which should be adequate for most engineering applications including high temperature bolting service. Included in Table I are data on

TABLE I

EFFECTS OF TEMPERING TEMPERATURE ON PROPERTIES ROOM TEMPERATURE TESTS

Unless otherwise indicated, all specimens were oil quenched from 1900 °F.

Tempering Treatment of °F	Hardness Rc	Yield Strength, psi 0.02 pct Offset	Yield Strength, psi 0.2 pct Offset	Tensile Strength, psi	Elongation, pct Over 4D	Red. of Area, pct	Charpy Impact Ft. Lbs.
1350 °F–2 hrs	29	.....	101,000	132,000	20	54	.....
1300 °F–2 hrs	31	102,000	116,000	142,000	18	53	.....
1275 °F–2 hrs	31.5	.....	117,000	143,000	18	54	.....
1250 °F–2 hrs	32.5	.....	119,000	145,000	18	53	.....
1200 °F–2 hrs	34.5	108,000	125,000	149,000	18.5	52	19-20[1]
1200 °F–2 hrs*	33	.....	123,000	148,000	18	51	.....
1200 °F–2 hrs**	34	.....	127,000	149,000	16.5	49	.....
1200 °F–2 hrs***	32.5	.....	126,000	148,000	17	49	.....
1150 °F–2 hrs	34.5	115,000	130,000	151,000	17	53	18-19[2]

*—Oil quenched from 2000 °F.
**—Retarded cooling from 1900 °F—simulated 2 in. round cooled in air.
***—Retarded cooling from 1900 °F—simulated 4 in. round cooled in air.
1—V-Notch.
2—Keyhole Notch.

pieces hardened by an oil quench and also on pieces cooled so as to simulate 2 in. and 4 in. round pieces cooled in air from the austenitizing temperature, 1900°F. Cooling rate from the austenitizing temperature, at least up to that of a 4 in. section cooling in air, has little effect on the room temperature properties of the tempered steel.

The elevated temperature properties of 422 were determined on specimens oil quenched from 1900°F and tempered for 2 hours at

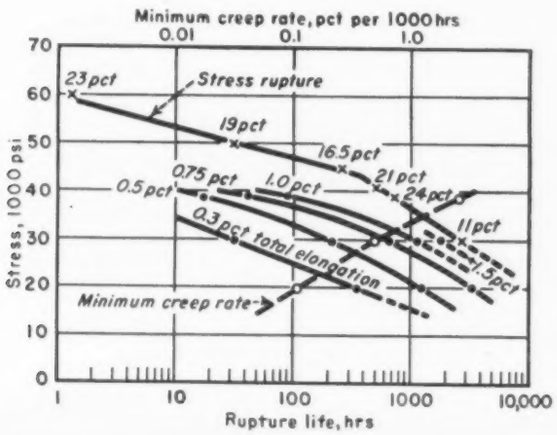


FIG. 2—Design curves of Crucible 422 at 1100°F. Heat treatment is the same as that shown in Fig. 2.

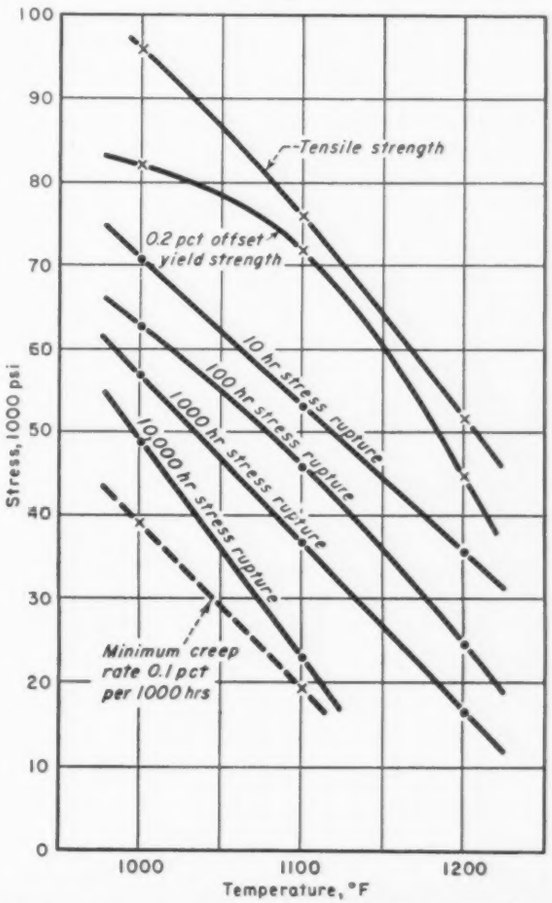


FIG. 3—Strength of elevated temperatures. Same heat treatment.

"Figures show 422 steel . . . satisfactory for long time service at 1000° and 1100° F . . ."

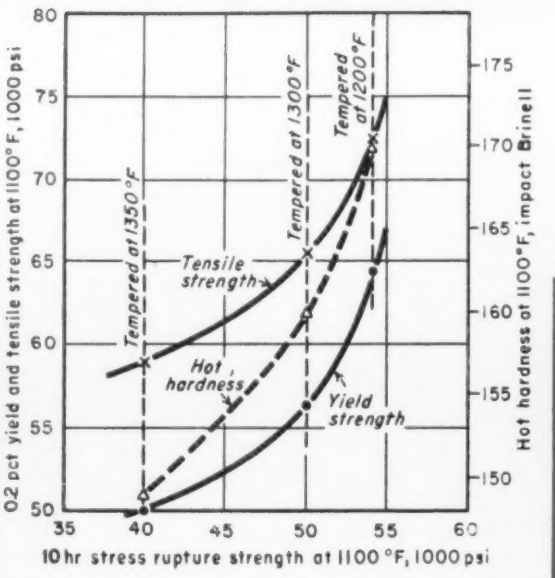


FIG. 5—Properties of Crucible 422 at 1100°F. Test pieces were tempered at temperatures of 1200°, 1300° and 1350°F.

FIG. 4—Stress rupture specimen above was broken after 7819 hrs at 1000°F—50,000 psi. Actual size is shown.

TABLE II

ELEVATED TEMPERATURE PROPERTIES

Testing Temperature of °F	Yield Strength, psi		Tensile Strength, psi	Elongation, pct Over 4D	Red. of Area, pct	Impact Strength, (V-Notch Charpy) Ft-Lbs
	0.02 pct Offset	0.2 pct Offset				
1000	65,000	82,000	96,000	25	67	38-39
1100	53,000	72,000	76,000	29.5	69	46-47
1200	30,000	45,000	52,000	30	83	.....
1300	18,000	28,000	32,000	30	84	.....
1300*	.....	.....	35,000	33	87	.....

Except as indicated, specimens were oil quenched from 1900 °F and tempered at 1200 °F-2 hrs.
*—Tempered 1300 °F-2 hrs.

TABLE III

COMPARISON OF CRUCIBLE 422 AND A.I.S.I. TYPE 302 AT 1000° AND 1100° F

	Stress, psi, to Cause					
	1,000 Hour Stress Rupture		10,000 Hour* Stress Rupture		1 pct per 10,000 hr Min. Creep Rate	
	1000 °F	1100 °F	1000 °F	1100 °F	1000 °F	1100 °F
Rezistal 422	57,000	37,000	49,000	23,000	39,000	19,000
Type 302**	36,000	25,000	27,000	17,000	20,000	13,000

*—Extrapolated Data.
**—Data taken from the average curves shown in "Report on the Elevated Temperature Properties of Stainless Steels", Special Technical Publication No. 124 of ASTM prepared by Ward F. Simmons and Howard Cross, 1952.

1200°F. Although it was possible to austenitize at temperatures up to 2100°F without encountering grain coarsening, austenitizing at 1900°F was used because at this temperature nearly all the carbides are in solution and heat treating at the higher temperature was unnecessary for good strength. Elevated temperature tensile and impact properties are presented in Table II.

Stress rupture properties, elongation versus time relationships and minimum creep rates are incorporated in the design curves shown in Figs. 1 and 2 which represent properties at 1000° and 1100°F. The elevated temperature properties are summarized in Fig. 3. These figures show 422 steel to be satisfactory for long time service at 1000° and 1100°F and for short time service at 1200°F. In Table III, the 1000 hour and 10,000 hour stress rupture strengths and the 1 pct per 10,000 hour minimum creep rates for 422 are compared with those for A.I.S.I. type 302. It is apparent that 422 is considerably stronger at both 1000° and 1100°F.

Another important criterion of suitability of a steel is the maintenance of high ductility values at elevated and room temperatures after a long period of service. The elongation values obtained after fracture and shown in Figs. 1 and 2 indicate the maintenance of good ductility. The values reported were calculated from measurements taken over 2.5 in. gage length on .357 in. diam specimens. Therefore, these values represent pct elongation over a gage length greater than 4 diam. Reduction of area, which is believed to give more significant indications of ductility than elongation values, for the pieces that ruptured after 7819 hr at 1000°F and after 2721 hr at 1100°F, are respectively 48 and 26 pct. The specimen that broke after 7819 hr at 1000°F is shown in Fig. 4. The great

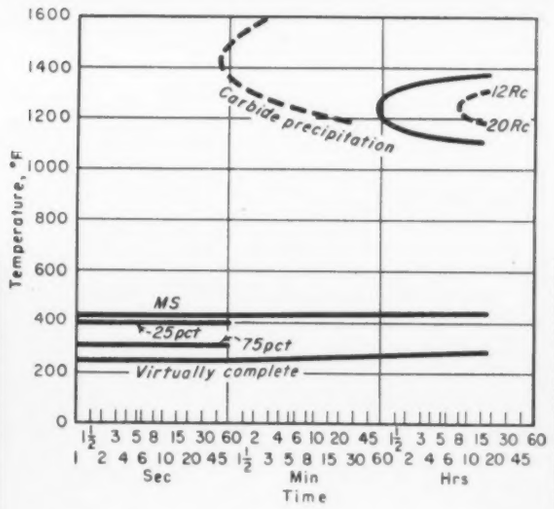


FIG. 6—TTT diagram of 422. Diagram indicates carbide precipitation on cooling from austenitizing temperature.

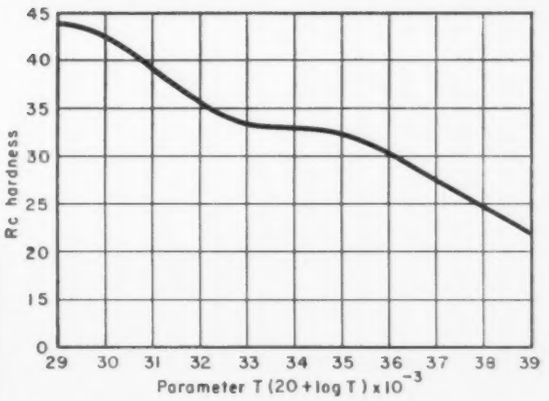


FIG. 7—Master tempering curve for Crucible 422. Curve was constructed using a constant of 20. Diagram shows a very flat portion at about 33Rc between parameters 32,600 and 35,000.

amount of necking down of the specimens illustrates the good ductility of 422 after long time service.

The high rupture ductility of 422 was generally assumed to be an indication of insensitiveness of this steel to stress raisers, and notched stress rupture tests were not performed. However, Brown[2] and associates did run notched stress rupture tests on Crucible 422. Their data definitely show that the notched stress rupture strength of 422 was higher than that of unnotched specimens at 1000°, 1100° and 1200°F. This shows that Crucible 422 is not weakened by the presence of sharp notches at the intended service temperature range.

Crucible 422 can be heat treated to full hardness by a relatively slow rate of cooling from a wide range of austenitizing temperatures with little effect on properties. The tempering temperature can be varied considerably without adversely affecting the good combination of strength and ductility. It was found, however, that the tempering temperature has a measurable effect on the elevated temperature strength of the alloy.

Tensile tests, 10 hr stress rupture tests and hot hardness tests by the Brinell impact method were made at 1100°F on material tempered at 1200°, 1300° and 1350°F. Results are illustrated in Fig. 5. For parts intended to operate for long times at 1000° to 1100°F a tempering temperature of at least 1200°F is recommended. Fig. 5 reveals the superior elevated temperature strength produced by that tempering temperature as compared with the higher temperatures of 1300° and 1350°F.

The TTT diagram of 422 is shown in Fig. 6. The diagram indicates carbide precipitation on cooling from the austenitizing temperature. Pearlite reaction does not start at 1200° to 1300°F until after about 1 hr. Therefore, it is possible to harden relatively large sections to full hardness. The Ms point is at 425°F and the martensite reaction is essentially complete when the steel is cooled to 250°F.

The new steel can be annealed to hardnesses of 197 to 223 Bhn (12 to 19 Rc) depending upon the prior condition. It may be annealed by austenitizing at 1650°F and either transforming isothermally at 1300°F for about 6 hrs, or cooling continuously at a rate of about 25°F per hr to about 1250°F and then air cooling. Where minimum hardness is not necessary, it can be annealed for best machinability to about 200 to 250 Bhn (25 Rc) by tempering at 1400° to 1450°F.

The master tempering curve for 422 is shown in Fig. 7. The curve was constructed using a constant of 20 as suggested by Nehrenberg.[3] Diagram shows a very flat portion at about 33 Rc and between parameters 32,600 and 35,000. The high degree of structural stability which is believed conducive to the good properties of 422 is attributed to this flat portion of the master tempering curve.

References

[1] Univ. of Michigan Engineering Research Institute—Wright Air Development Center project covering four low-alloy steels for rotor disks of gas turbines in jet engines.

[2] W. F. Brown, Jr., M. H. Jones, and D. P. Newman, "Influence of Sharp Notches on the Stress-Rupture Characteristics of Several Heat-Resisting Alloys," ASTM Preprint 76, June 1952.

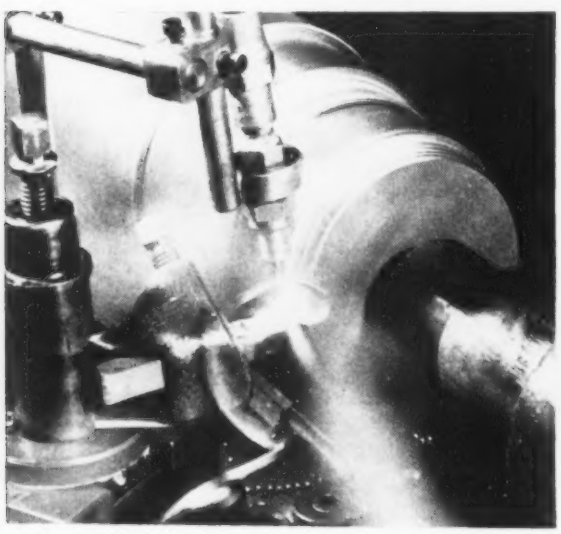
[3] A. E. Nehrenberg, "Master Curves Simplify Stainless Tempering," Steel, V. 127, October 23, 1950.

Metal Show Documents

The 34th National Metal Congress and Exposition held in Philadelphia Oct. 20 thru 24th attracted some 50,000 engineers and visitors. Technical meetings started Sat., Oct. 18th, and ran all week with lecture courses featured in the evenings. Sponsored by four societies: American Society for Metals, American Welding Society, Society for Non-Destructive Testing and Institute of Metals, AIME, the technical meetings competed for the visitors' time with the hundreds of exhibits shown at Convention Hall. Two miles of red rugs used for the first time at the biggest metal show on earth eased but did not eliminate the annual epidemic of foot weariness. Twenty-three college alumni luncheons were held during the week.

Technical meetings got off to a head start at 9:30 a.m. Sat., Oct. 18th. Saturday and Sunday meetings on Modern Research Techniques were split into well attended seminars which permitted highly technical treatment of each subject. On Saturday, metallographic and diffraction research methods were discussed. On Sunday, seminars presented the latest in mechanical, ferromagnetic and radioactive research methods.

Monday, first day of the Metal Show Exhibition, thousands more descended on the city, half of them heading straight for the hotels where all four societies started their technical meetings simultaneously. Although excellent sessions on creep rupture, recrystallization, high temperature phases, hardenability, etc., were featured by ASM, the sessions on titanium held by AWS and Institute of Metals, AIME, stole the show during the first few days. The Society For Non-Destructive Testing also attracted large audiences at its technical sessions with the result that many meeting-conscientious engineers only



CARBON DIOXIDE, a coolant in this lathe operation, permits more accurate machining by removing heat, preventing warping. CO_2, shown by Pure Carbonic Div. of Air Reduction Co., vaporizes quickly, leaves no residue.

THE CARBOTROL instrument, left, automatically corrects the air-gas ratio produced by the generator, right, to a constant dew point as the raw gas supply and pressure vary. Norbert-Koebel, left, of Lindberg explains it to a visitor.

Technical Progress

got out to see the exhibitions during the evenings —or not at all.

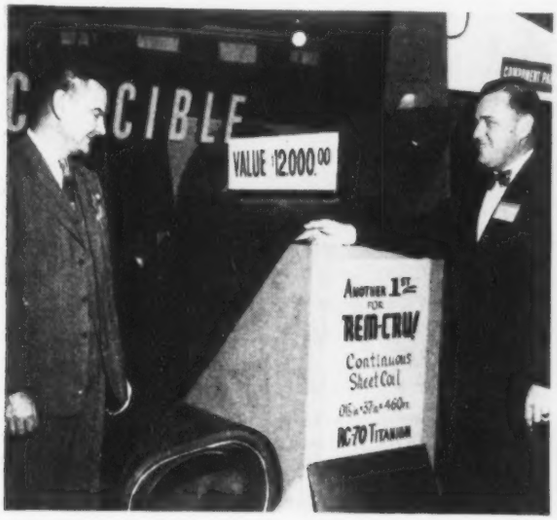
Titanium asserted itself as a crowd-getter early Monday morning when C. B. Voldrich, Battelle Memorial Institute delivered the Adams Lecture to AWS. The paper "The Welding and Brazing of Titanium Alloys" was a worthy contribution to the literature and a highly receptive audience overflowed the Rose Garden at the Bellevue-Stratford.

Overflow crowds again attended the Titanium Symposium held by AIME Tuesday morning. One of the best delivered papers of the entire week was given at this session by M. A. Hunter, Rensselaer Polytechnic Institute. Mr. Hunter reviewed the early history of the now very popular metal by recounting his experience in producing the first ductile titanium ever made at the General Electric Laboratories in 1906. This product was made in a bomb by sodium reduction and Mr. Hunter delighted his audience with an impromptu interpretation of his original notes of these early experiments. Many of the conclusions reached by Mr. Hunter way back in naught 6 and 7 hold true today.

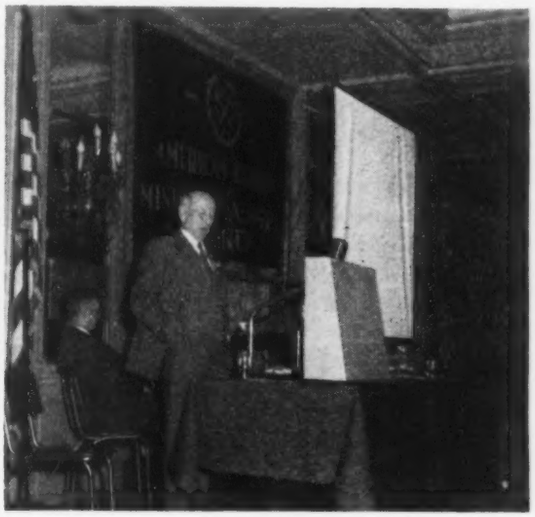
"The Significance of Titanium in Air Frame Construction" was presented by Col. J. S. Dick, Air Force Materiel Command. "Titanium as an Ordnance Material" was discussed by Col. B. S. Mesick, commanding officer, Watertown Arsenal. Col. Mesick reported that the metal has now reached the point where industry in general is becoming interested and it won't be too long before titanium outgrows its present "war baby" status. He predicted that by January 1954 the industry would be producing at a rate of 5000 tons annually. Most other experts agreed after the meeting that this figure was a little optimistic and that the best possible rate of production by January would be much closer to 2000 tons.

The morning meeting adjourned for lunch and at 2:00 p.m. reconvened under the same chairmen, M. H. Hunter and J. R. Long and again the audience overflowed the Crystal Room of the Adelphia Hotel. This portion of the symposium featured talks by the metal producers. E. H. Gee of Du Pont described the progress in sponge making, all of which is still being produced by magnesium reduction processes. Mr. Gee said that Du Pont is now producing sponge in 3000-lb batches. W. L. Finlay, Rem Cru Titanium, Inc., discussed the properties of various titanium alloys and announced that Rem Cru has successfully cast the largest ingot yet produced. This ingot, weighing 4000 lb and valued at $20,000, was on display at the Rem Cru booth at exhibition hall. As late as Thursday, however, it had not been sold.

A representative of L. R. Frazier, General Electric Co., reviewed GE's experience with alloy forgings and bars for use in jet engines. Rotor wheel and blade forgings as well as spacer rings are under test by General Electric and production of these items on a large scale is about to



TITANIUM STRIP is now available in regular mill production quantities. The above coil is the largest coil made to date. George Fraser, right, Rem-Cru sales manager, tells a visitor all about it.



Mr. M. A. Hunter addressing the well attended Tuesday morning Titanium Symposium. Mr. Hunter, cochairman of the meeting, related his early experiments on the production of titanium by sodium bomb methods.

begin. The speaker did not mention that just a few days before his talk GE placed the largest single order for titanium yet placed. This order for $\$1\frac{1}{4}$ million worth of metal for compressed disks in the J73 engine is significant.

On Wednesday morning AWS took up where Mr. Volridge had left off by holding a welding symposium on the metal which by this time had made the local newspapers and stolen the show. Messrs. Chyle and Kutuchief, A. O. Smith Corp., in their paper "Practical Aspects of Arc Welding Titanium Alloys" demonstrated that ductility from 2.1 to 10 pct elongation in 1.4 in. could be attained by proper techniques on present alloys. They allowed as how the technique of vacuum chamber welding might not be considered too practical but at least it is possible. These tests were run on $\frac{1}{2}$ and $\frac{5}{8}$-in. thick plate of currently available titanium alloys and an experimental 4 pct Cr, 2 pct Mo type. The experimental alloy showed the best properties. As welded, this alloy at 110,000 psi ts had 12 to 14 pct elongation and would bend 5° before cracking. After heat treatment at 1350°F for 30 min., furnace cooling to 1150°F and water quenching, the same material at 108,000 psi ts showed 15 pct elongation and would take a 30° bend before cracking.

Three heat treatments described

In another paper at this session "The Effects of Fe, Mn, Cr and Mo on Welds in Titanium" was presented by G. E. Faulkner and G. B. Grable of Battelle Memorial Institute. Alloy contents of all these metals at three levels: $1\frac{1}{2}$ to 3 pct, 3.5 to 6 pct and 7 to 15 pct were tested. Three types of heat treatment were given to all tests in the effort to increase as-welded ductility. A "beta anneal" from 1400°F slow cooled to room temperature increased the ductility of the high alloy group. A "beta quench" from 1450°F to 1750°F depending on alloy content, was also beneficitl to some grades. For those grades which are alpha-beta in nature the best heat treatment found to increase ductility was, hold at 1350°F 30 min, slow cool to 1150°F then water quench. This treatment stabilizes as much beta phase as possible and prevents low temperature alpha transformation, a phase which is brittle and cannot be made ductile once it forms.

Several of the largest crowds at this year's technical sessions weer attracted by the papers and demonstrations on non-destructive testing. This year's program included X-ray, ultrasonic, electromagnetic, liquid penetrant and other testing methods.

Leslie W. Ball, Thomson Laboratories, U. S. Naval Ordnance Test Station, Pasadena, Calif., in his paper, "Ultrasonic Adsorption, Its Relation to Test Interpretation and Its Correlation with Service Performance," said interpretation of results is often difficult. The speaker said that correct interpretation of sonic data offers an excellent opportunity toward a better understanding of slip bands, crystal lattice and grain boundary phenomena.

TV screen replaces oscilloscope

Probably the largest and most enthusiastic audience attending the non-destructive testing sessions heard a paper, "Electronic Reproduction of Ultrasonic Immersion Images" by Donald Erdman, President, Electro Circuits, Inc., Pasadena, Calif. Flaws such as bursts, cracks and metallic segregation are reproduced on a television screen so that their size and position are readily determined. Both steel and aluminum were examined. The author utilizes "immersed scanning" in which a quartz crystal is placed from several inches to several feet from the part. The intervening space is filled with liquid. This method is particularly effective in eliminating multiple reflections.

On Tuesday afternoon ASM held a session on hardenability which featured two important papers. A time-saving end-quench bar for carburizing grade steels having a trapezoid cross-section was described in a paper by Kayser, Thomson and Boegehold of General Motors Research Laboratories Div. Two opposite sides of the bar are coated with copper to inhibit carburizing. Tests along the gradient of the carburized area may be made without grinding.

Results of an investigation of the effect of boron on case hardenability were reported by C. F. Jatczak and E. S. Rowland, Timken Roller Bearing Co. Steels tested included 80B20, 94BV20, 94B20 and 47B20. The authors reported that for all heat treatments used, case hardenability of boron-treated carburizing steels decreased with an increase in carbon content. In double quench practice, the effect of boron is low to negligible at high carbon levels when normal hardening temperature is used. Under many conditions boron is decreasingly effective as a hardening agent in steels having more than 0.80C.

Chrysler metallurgists, Chapman and Jominy, reported that, despite widely divergent heat treatments, each designed to achieve a different result, three batches of the same SAE 5140 steel showed the same endurance limit. Impact varied considerably, the authors reported, following these heat treatments but there was no substantial change in the endurance limit as between embrittled and non-embrittled steel tested at room temperature and −35°F.

METAL SHOW HIGH SPOTS

▶ First showing of a 12-station fully automatic shell molding machine. This turntable machine complete with sand handling, curing and stripping makes 500 to 700 molds per hour using one operator. Maximum pattern size is 30 x 40 in.

▶ Drawability of steel sheets can be checked rapidly with a simple testing device demonstrated by Steel City Lab. Used in production line operations it's up to 95 pct accurate. Flex-Tester is portable, inexpensive, has been used by Fisher Body and was developed by Jones & Laughlin Steel Co.

▶ National Lead introduced its new plastic die material Nalco-Lite. Cost is about a third that of Kirksite. Claim it is excellent for short-run production. Die exhibited had produced about 500 stampings and was beginning to wear.

▶ Growing size of magnesium castings was demonstrated with a 1630-lb casting by Rolle Mfg. Co.

▶ Carbide kits with enough samples for the user to run tests in his own shop were shown by Carboloy Dept. of General Electric. The kit costs $10.75 and contains nine smaller samples of Cr carbide 608.

▶ Use of hardened precision balls for sizing of internal diameters was demonstrated by Industrial Techtonics, Inc. These carbide balls are used to accurately size and burnish holes.

▶ Largest titanium ingot yet cast was displayed by Rem-Cru Titanium, Inc. The ingot weighed 4000 lb and cost $20,000.

▶ An entirely new process for casting of stainless steel and heat resisting castings was shown by Alloy Engineering & Casting Co. Ceramic face molds with sand backing are used. Molds were pre-heated and temperature controlled with centripetal casting.

▶ A high speed, heavy duty cutoff machine was demonstrated by Stone Machinery Co. A 7½ hp geared-in-head motor drives the M75's abrasive wheel with the effectiveness of a 15hp belt driven job. Sample cutting speeds: 2-in. angle, 6 sec; 3-in. I beam, 8 sec; 1-in. cold-rolled round, 4 sec. Cut pieces showed no discoloration.

▶ Tapping, drilling and shaping of precision holes in carbides and tool steels in die sections was demonstrated by Elox Corp. with its dual purpose M-300 electron drill. Four surface finishes from coarse to superfine are obtainable. Electrode wear is less than 1 in. for drilling 1 in. of tool steel. Some sizes of electrodes using superfine cutting will drill as much as 33 in. of steel per in. of electrode.

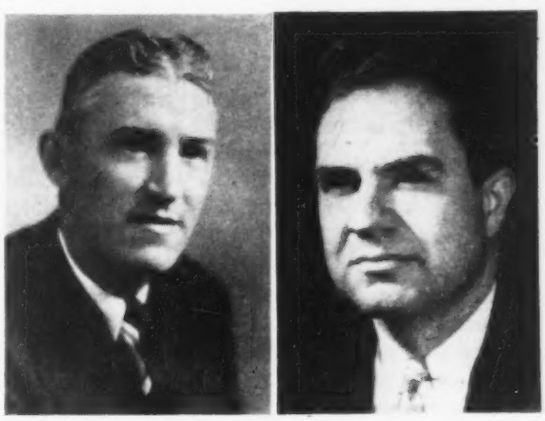
▶ First tubes of graphite tool steel made by Timken Steel & Tube were on display at the A. Milne & Co. booth.

▶ An aluminum clipon fastener to replace putty in fastening windows in place was shown by Reynolds Aluminum Co. A piece of aluminum weather stripping is held in place by a small aluminum clip. Advantages: Less labor, better looking, installed faster, no maintenance, can be kept on or removed easily.

▶ A new diamond lapping compound has a high concentration of carefully wetted diamond particles suspended in grease. The compound, shown by National Diamond Hone & Wheel Co., is applied with a hypodermic syringe. Mirror finishes are obtained.

▶ Use of natural gas on Flamatic surface hardening machines was demonstrated by Cincinnati Milling Machine Co. Users now have a choice of acetylene, propane, natural gas or manufactured gas as fuel for this type of hardening operation.

▶ A revolutionary testing unit was shown by Baldwin-Lima-Hamilton Corp. The model FGT, in which the weighing system is based on SR-4 strain gages, can be fitted to determine creep, rupture and relaxation properties of metals. It will also perform dynamic testing and recording work. For impact testing an oscilloscope screen can be photographed to provide dynamic loading strain graphs.



NEW ASM OFFICERS: Ralph L. Wilson, left, director of metallurgy, Timken Roller Bearing Co., Steel & Tubes Div., is the new president of the American Society for Metals. Vice-president is John B. Austin, right, director of research U. S. Steel Co., Kearny, N. J.

It's continuous—

SPEEDY PLATING

of small diameter steel tubing

An unusual plating setup applies copper to small diameter tubing in a continuous operation at Rochester Products Div. of General Motors Corp., at Rochester, N. Y. At speeds ranging from 40 to 150 fpm on tube diameters from 5/8 to 3/16 in., copper coatings of 0.0004 in. are applied in a single pass. This is believed the highest speed yet attained in continuous plating of this type and thickness on steel tubing.

To deposit this amount of copper so rapidly, 2500 to 4000 amp are applied at 10 to 15 v. Current densities are adjusted to about 10 to 20 amp per sq in. A special solution of the potassium cyanide type is used.

Current is applied through pairs of copper rolls grooved to fit the size of tubing being run. There is one pair of rolls outside each end of the tank in which current is applied.

The tube is run in a straight line below liquid level and enters and leaves the tank through a ceramic bushing. Bushings are not a close fit around the tube. Leakage between tube and bushing is caught and pumped back into the tanks without significant loss.

Tubing is fed from coils and is either cut to lengths or recoiled at the opposite end. To avoid rethreading through tank bushings when a coil runs out, the tail end of one coil is butt welded to the lead end of the next. When a weld is made, plating generators are cut out automatically. Tubing from feed-in coils runs through a sizing stand and straightening rolls before entering the first tank.

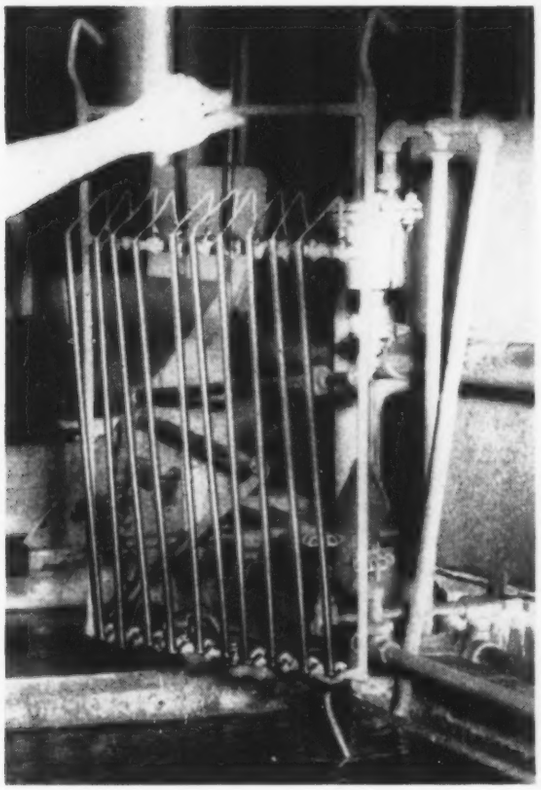
In the first tank, a 4-oz-per-gal solution of a caustic cleaner is used and is heated to 185° to 190°F, reverse current from iron cathodes being applied. In the second tank is a 10 to 20 pct sulfuric acid cleaner, also used with reverse current. Next, comes a cold water spray rinse, after which the tubing enters the first copper plating tank.

Four two-line plating tanks in series, each use the same potassium cyanide solution. Solution concentration is varied according to the speed at which the tubing travels. An average solution contains 7 oz of copper cyanide and 35 to 40 oz of sodium carbonate per gal. Pure copper anodes are used. Solution temperature is held at 200° to 205°F. The solution is constantly agitated and recirculated.

Roll contacts for feeding current through the tubing are of copper and have copper shafts. The shafts run in mercury baths by which the current is fed in and out of the shafts. This avoids having a slip ring with brushes. Rolls are driven only by contact with the tubing which is pulled through the plating setup by a special pulling mechanism near the end of the line.

After leaving the plating tank, the tubing is fed through a tank containing live steam and air. No water rinse is needed. Beyond the pull out rolls, tubing is run onto a bench where a flying cut-off cuts the tubing to specified lengths. If orders require shipment in coils, the tubing is run onto coiling reels.

Copper coatings applied in this setup give high corrosion resistance. In many cases, however, the copper is applied to facilitate subsequent brazing of fins to the tubing or, if it is to be redrawn, act as a lubricant and help prolong life of draw dies.



ZINC-COPPER-CHROMIUM plating of radio antenna tubes is done with tubes in spring rack at Rochester Products. Good corrosion resistance is reported for plating which replaces copper-nickel-chromium plate formerly used.

Another unusual setup is used in plating short lengths of automobile radio antenna tubes. These steel tubes are constantly exposed to weathering —often to salts applied to roads in winter. Formerly, heavy coatings of copper and nickel and a final coat of chromium were applied but restrictions on the use of nickel have forced a change to a zinc-copper-chromium coatings. Laboratory and service tests show good corrosion resistance.

During plating, racks hang from reciprocating cathode bars of a semiautomatic setup. Zinc anodes are bagged but the solution is not circulated, although rack motion keeps the solution agitated. After this plating, there is a cold rinse in water and a quick dip in a 0.5 pct nitric acid soluton followed by another cold water rinse.

A copper strike of 30 sec follows in a cyanide solution at 50 amp per sq ft current density, followed by another cold water rinse. Then, copper is plated for 10 min in a high strength copper solution held at 150°F. Current density is 30 amp per sq ft but with an interrupted current cycle controlled by a timer alternately on 5 sec and off for 2 sec. This yields a bright copper coat 0.0003 to 0.0004 in. thick. Plating is done in a semiautomatic tank.

After a cold rinse, comes chrome plating for 3 min in a self-regulating high speed type solution with sulfate constant CR 110. This yields a bright final coat. Plating is followed by a cold water rinse.

NEW BOOKS

"Was Der Mann Aus Der Schmiede Von Seiner Arbeit Wissen Muss," by A. Schwartz. This intensely practical book (What the man in the forge shop must know about his job) covers practically all forge shop operations. Each operation is illustrated by one or more sketches. The author not only knows forge practice but is an accomplished artist. Many labor and money saving hints are included. Forge practice, crane practice, and health and safety are covered. The book is based on forge operations in a steel plant in Western Germany. It does not cover mass production of die-forgings under hammers and in forging machines. Its greatest value if for apprentice education. Stahleisen, Dusseldorf, Germany. $1.75. 126 p.

Reviewed by W. Trinks, Professor Emeritus, Carnegie Institute of Technology.

"Methods of Applied Mathematics," by F. B. Hildebrand. The text aims to provide engineer and physicist with fact and techniques in four fields not usually treated in advanced calculus courses but which are useful in varied applications. Included are: Matrices, determinants and linear equations; calculus of variations and applications; difference equations; integral equations. Prentice-Hall, Inc., 70 Fifth Ave., New York. $7.75. 523 p.

"Strain Gauges, Theory and Application," by J. J. Koch, R. G. Boiten, A. L. Biermasz, G. P. Roszbach, G. W. Van Santen. The book, published in English for the first time, provides a manual of experience in the practical use of strain gages and factors affecting successful use of this technique of measurement. Published by N. V. Philips' Gloeilampenfabrieken. Distributed by Elsevier Press, Inc., 402 Lovett Blvd., Houston 6. $2.75. 93 p.

"Gmelins Handbuch Der Anorganischen Chemie. System No. 27, Magnesium, Part A 4." (In German.) Fourth and concluding part of the Gmelin magnesium volume. Covers binary and ternary alloys, metallurgy, production processes, other physical and chemical properties. Chemical behavior and corrosion resistance are covered in detail. A systematic presentation of many surface treatment processes and methods is included. Walter J. Johnson, Inc., 125 East 23 St., New York 10. $23.81. 336 p.

Hints for smoothness—

GEAR TOOTH DESIGN

Modified for better service

By Kenneth N. Mills
Machinery Products Manager
Ideco Division
Dresser Equipment Co.
Columbus, Ohio

The life and efficiency of an involute gear train depends to some extent on the design and manufacturing accuracy of the individual gears. Design modifications, which can be produced on standard machines with standard cutters, will provide better gear performance. These modifications can reduce excessive wear, increase tooth strength, minimize fatigue failures, provide quieter operation and improve the contact ratio and pressure angle. Gear tooth design must favor the formation and maintenance of an oil film. Smooth operation also depends on tooth profile and spacing accuracy based on experience.

Performance of a gear train is partly dependent on the care and skill used in its design and manufacture. All gears transmit motion by rolling and sliding. Therefore, their performance is influenced by the characteristics of the lubricant. The lubricant must have sufficient film strength to resist applied loads and gear tooth design must favor formation and maintenance of a satisfactory oil film on mating tooth surfaces.

If gear teeth are of the involute form and made by a generating process, many design modifications can be produced on standard machines with standard cutters which will influence gear train performance. Other minor changes in standard involute tooth design can be made to improve gear performance. These modifications are possible on standard machines with special cutters. Such modifications will increase gear tooth resistance to service damage and reduce production costs.

Most modern heavy-duty gear trains use the involute gear tooth form which is easier to generate accurately. It also affords design flexibility not found in other systems. Its advantages can be best visualized by examining its basic principles.

The involute curve, representing the tooth profile, is the curve traced by unwinding a string from a base circumference. The involute cannot extend below this base circle. Any portion of the tooth profile extending below this base circle will be inactive and must be generated on an assumed profile. This portion of the involute will be undercut and will reduce the length of the active tooth profile and tooth strength, Fig. 1.

Action of a mating pair of involute gears can be compared to two pulleys with an endless crossed belt, Fig. 2. The straight sections of the belt represent the lines of action for both directions of rotation. The crossing point represents the point at which the pitch circles are tangent. This illustrates the flexibility of the involute system in center spacing.

A change in the center distance will change the obliquity of the straight portions of the crossed belts with the line of centers. Also, location of the crossing point of the belts will change. However, these changes will not affect the speed ratio. Similarly, the operating center distance for a pair of mating involute gears can be varied within limits without altering their speed ration. In practice, adjustment of

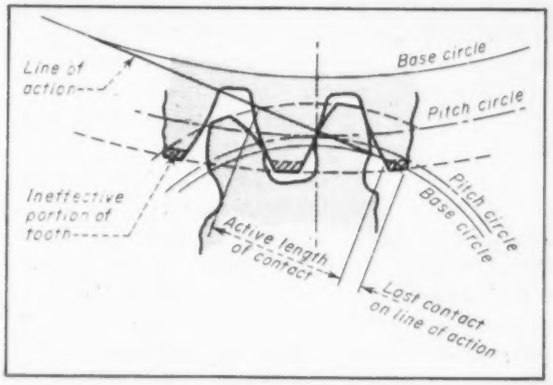


Fig. 1—Any part of the tooth profile extending below the base circle will be inactive and undercut. Teeth formed in this manner will lack strength.

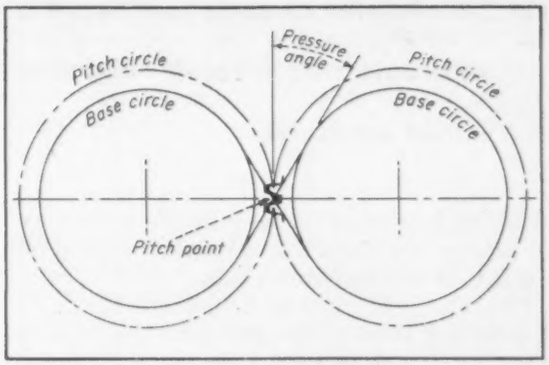


Fig. 2—A mating pair of involute gears is compared to two pulleys with an endless belt. The straight sections of the belt represent the lines of action.

the gear blank OD controls the involute curve section forming the gear teeth. When this change is made in a pair of generated involute gears, the pressure angle and running pitch diameter are modified. However, the speed ratio is not altered, because the base circle diameter is unaltered.

The basic nature of relative motion between two mating involute tooth surfaces is illustrated in Fig. 3. Tangents to the base circle represent the relative locations of the generating lines for equal angles of rotation of the base circle. Involute curve lengths between two adjacent generating lines represent the movement along the involute curve produced by the corresponding angular movement of the base circle. The mating points on the two involutes are g-a, h-b, i-c, j-d, k-e, etc. Due to differences in the lengths of the points on the mating involute curves, relative sliding exists between the curves at all points except the pitch point. The rate of sliding increases as the contact point approaches the base circle and becomes infinite at the base circle. For this reason, gears should be designed to avoid tooth action near or at the base circle.

Tooth action in the critical base circle zone usually occurs when the gear has a small number of teeth and is usually confined to pinions. It can be avoided by one or a combination of the following alterations: (1) increasing the number of teeth, (2) using stub teeth, (3) increasing the gear blank OD or (4) increasing the pressure angle. Each solution has limitations which must be observed.

The full depth involute tooth has an addendum equal to one divided by the diametral pitch and is commonly used on spur gears. In the stub tooth system, length of the addendum is decreased. Therefore, depth of the tooth below the pitch line is decreased. This decrease in tooth depth increases the distance from the base circle to the start of the active involute profile. If the full depth tooth profile does not extend below the base circle, it will discard some of the

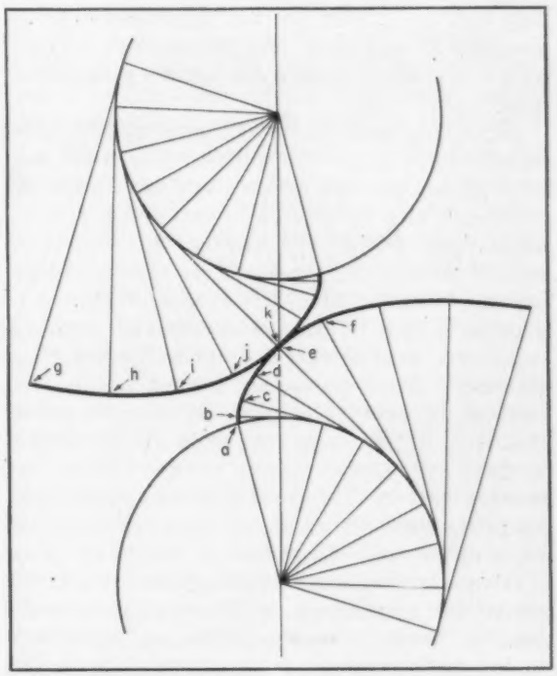


Fig. 3—The involute curve can be visualized as the curve traced by unwinding a string from the base circumference. Mating points of the involutes are g-a, h-b, i-c, etc. Due to differences in lengths of points on mating curves, relative sliding exists at all points except the pitch points.

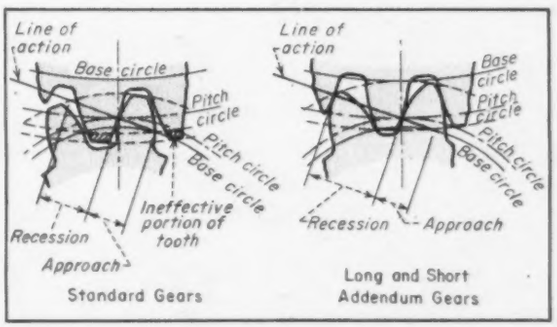


Fig. 4—This comparison between standard and long and short addendum gears shows the greater base on a long addendum tooth which increases strength.

"A chamfer on each gear tooth is desirable where tooth deflection is not excessive . . ."

sensitive portion of the involute. In this system of gearing the addendum is usually equal to 0.8 divided by the diametral pitch.

The stub tooth system is common on single helical and herringbone gears. Its use on spur gears is limited because it decreases the number of teeth in contact. This condition is not too critical in helical gearing because an adequate contact ratio is assured in most instances. To assure uniform transmission of motion, the second pair of teeth must be in contact before the first pair are out of contact. Minimum overlap for smooth operation depends on such factors as tooth profile and spacing accuracy based on experience.

Increasing gear blank OD is a modification which can be applied to spur, single helical and herringbone gearing with equally advantageous results. It can be applied in two distinct manners. First, pinion OD can be increased and gear OD can be decreased a corresponding amount. This is called the long and short addendum system. Gears and pinions with involute teeth generated in this manner will operate on standard center distances. Second, pinion OD can be increased and gear OD can be made standard. In this case, gear teeth are generated to standard depth and gears are operated on increased centers. This modification changes the operating pressure angle but does not alter the basic nature of tooth action.

Comparison of tooth action with an undercut pinion and a gear train with long and short addendum teeth is shown in Fig. 4. Note that pinion tooth strength is increased because the thickness of the long addendum pinion tooth is greater at its base. Also, total length of the line of action is increased. Therefore, the number of teeth in contact is increased and the load per tooth is decreased. The increased length of the line of action should assure a lower noise level.

In the long and short addendum gear train, the arc of approach is materially shorter than the arc of recession. In an equal addendum gear train without undercut, these two arcs are equal. This change in the lengths of the arcs decreases the possibility of the tips of driven teeth from digging into the flanks of driver teeth and scraping the oil film away in front of the contacting teeth. Otherwise, this action will wear the teeth because it occurs in the zone of maximum sliding.

Lubrication during recession

Good lubrication during recession makes it advantageous to have the maximum practical tooth action during this phase. While some of the advantages apply to the relationship between the driven and driver members, they do not apply where the driven member may also be the driver. If the system is applied to this type drive, its tooth action advantages become disadvantages and will result in excessive noise and possible tooth wear.

In all designs using enlarged diameter gear blanks, diameter increase may be limited by tooth pointing. To assure adequate tooth tip strength, tooth tip width should not be less than 10 pct that of standard tooth width.

If the drive is reversing and it is desired to increase the pinion diameter to eliminate undercut, gear diameter should be increased proportionally. As booth diameters are increased, the gears will require an increased center distance and will operate on an increased pressure angle. Their pitch diameters and operating pressure angle can be determined with the following equations:

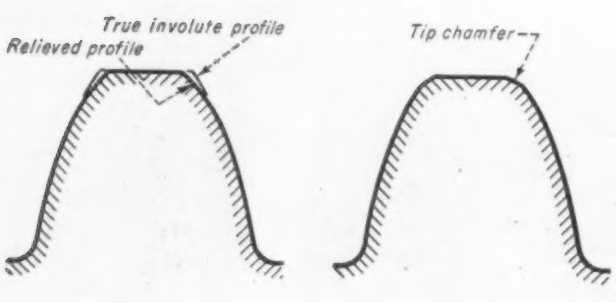


Fig. 5—Tips of gear teeth can be modified either by relieving the tooth profile or by chamfering. Either modification will prevent the entering gear tooth from scraping the oil from the pinion tooth flank.

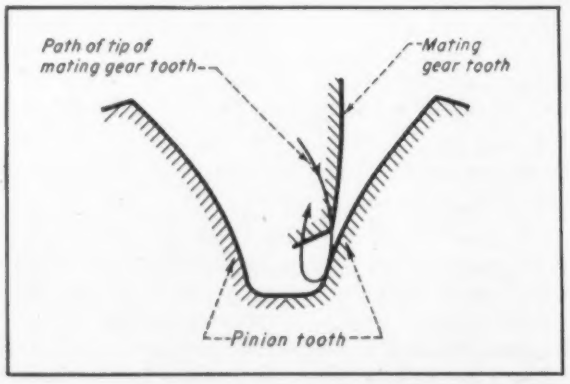


Fig. 6—Without tip modification, the entering gear tooth tip will remove oil from the pinion tooth flank. Since this is the zone of maximum sliding, excessive tooth wear will result unless the tooth is modified.

$$dp = Dp\left(1 + \frac{2E}{Dp + Dg}\right)$$

$$dp = Dg\left(1 + \frac{2E}{Dp + Dg}\right)$$

$$\cos \phi_1 = \frac{\cos \phi}{1 + \frac{2E}{Dp + Dg}}$$

where:

Dp = Theoretical Pitch Diameter Pinion
Dg = Theoretical Pitch Diameter Gear
dp = Running Pitch Diameter Pinion
dg = Running Pitch Diameter Gear
ϕ = Nominal Pressure Angle
ϕ_1 = New Pressure Angle
E = Amount of Center Distance Increase

Outside diameters of gear blanks must be established by adding equal amounts of the running pitch diameters of each element. This will produce gears with equal length of approach and recession. In speed reduction gear drives, the tips of the gear teeth can be modified to prevent the entering gear teeth from scraping the oil film from the flanks of the pinion teeth, Fig. 5. This can be done in two ways. First, the outer end of the gear tooth profile can be relieved. This is commonly called tip modification. Second, the tip of the gear tooth can be chamfered. Each alteration will give good results if done properly.

The reason for these modifications is shown in Fig. 6 which shows the path of the gear tooth tips as it enters the pinion tooth. The gear tooth tip travels along the flank of the pinion tooth near the root before the mating tooth surfaces engage. If a sharp gear tooth tip contacts the flank of the pinion tooth, it will scrape the lubrication film from the mating contact surface. Since maximum sliding occurs in the contact zone, excessive tooth wear will result unless steps are taken to avoid it.

Relieved involute profile reduces tooth deflection in gear trains with small contact ratio. If excessive tooth deflection exists, the gear tooth tip will advance relative to the pinion tooth and gouge the flank of the pinion tooth. This condition does not generally occur in high angle helical and herringbone gear sets.

Relieving the tip of the involute profile has a disadvantage where tooth deflection is not excessive because it reduces the line of action length thereby increasing individual tooth loading. Theoretically, tooth profile beyond the start of modification is inactive because it is relieved below the involute profile. Minute tooth deflections will reduce the amount of this contact loss but in high angle helical and herringbone gears this loss will be real. The effect of this reduction in the active tooth profile length on the line of action length is shown in Figs. 7, 8, where tip modification is applied to both elements. If applied to a single element, the line of action length will increase because the contact loss on the element with standard teeth is eliminated.

A chamfer on each gear tooth corner is desirable where tooth deflection is not excessive. The chamfer can be made with a special cutter. In practice, a tooth profile chamfered in this manner eliminates sharp, scraping edges which might destroy the oil film. Thus, it glues the desired results with minimum contact loss.

Gear tooth resistance to failure by breakage can be improved by modifying the fillet size at the base of the tooth. In a generating process, this can be done by modifying the tips of the cutter teeth. The cutters are designed to generate a large radius at the root of the tooth. This increase in root radius will materially increase tooth resistance to fatigue failures because it reduces stress concentration at the root. Modifications of this type can usually be applied to standard pinion teeth with minor or no changes in pinion blank design.

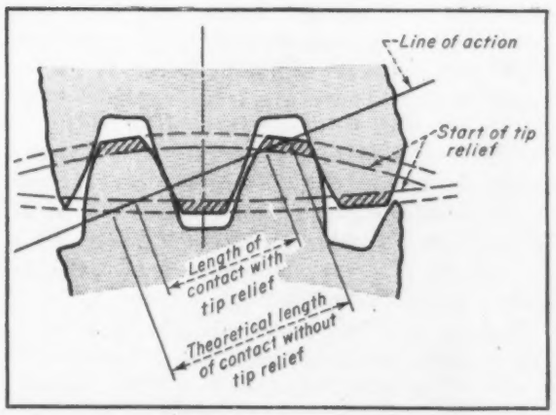


Fig. 7—Tip modification, if applied to both elements, will reduce the length of contact. If applied to only one element, the line of action length will increase.

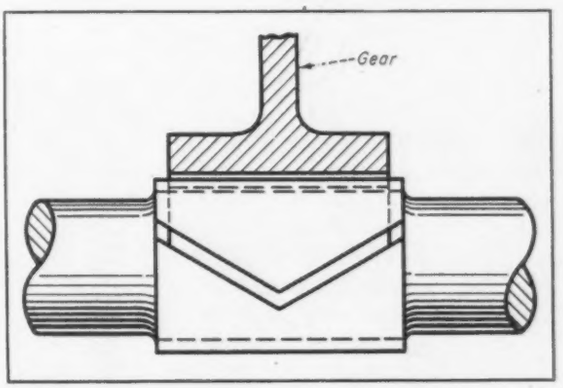


Fig. 8—A pinion face width slightly greater than that of the gear reduces fatigue failure. This modification reduces stress intensity at the free edge of the tooth.

Greater sfpm—

BEARING RACES
Machined at high speed

By Roger Brooks
Senior Process Engineer
Hyatt Bearings Div.
General Motors Corp.
Harrison, N. J.

To reduce the cost of machining bearing races, Hyatt Bearings Div. of General Motors Corp. turned to high velocity machining. Cutting speed was raised from 200-275 to over 600 sfpm on an automatic lathe. To achieve this high velocity, greater horsepower was required, tools were increased to the largest practical cross section, carbide cutting tool bits were used and chip breakers were redesigned. Production was increased and surface finish was improved.

Surface speeds of cutting alloy steels such as SAE-52100 and 4620 have for many years been restricted to low velocities due to a variety of restraining factors such as cutting tool materials, horsepower available at the machine, machine rigidity, cutting fluid and tooling. In recent years developments by machine tool builders and users in machining at high speeds have set forth many new principles of cutting metal. High speed machining of bearing races at velocities from 600 to 700 sfpm is now being performed at the Hyatt Bearings Div. of General Motors Corp., Harrison, N. J.

For some time a leading make of automatic lathe was used extensively in machining steels for bearing races. Horsepower available at the machine by today's standards was low but about all the machine should deliver due to design features. Cutting fluid came through large pipes allowing a limited amount to reach the proper places. Tooling, in rigidity, was in keeping with the machine; chucking was by air power. These were the conditions for low velocity turning of 200 to 275 sfpm. Thousands of bearing races were turned by this method and it proved to be a good one.

To reduce the cost of machining these races, high velocity machining had to be considered. Since the machine tool builder had found the most economical high velocity to be around 600 sfpm, a goal was set at 600 to 700 sfpm. Horsepower at the machine was increased from 15 to 40. The machine was built to safely transmit 75 hp. Tools such as boring, turning, and chamfer bars, were increased to the largest practical cross section and heat treated for rigidity and resistance to chip erosion. Mechanically held carbide cutting tool bits were used wherever possible to replace cast alloy brazed tools.

Tests showed that heavy cuts at high velocity were most economically made using the hardest grades of carbide available due to their crater

Ed. Note: This work on high velocity machining was done in cooperation with the Jones & Lamson Machine Co., Springfield, Vt. on J&L Fay automatic lathes.

resistance. Since these grades of carbide do not lend themselves well to brazing, the next softer grades were used for form and chamfer tools. During initial tests, grades K5H and 831 were used for mechanically held tools, while K3H and 78 were used for brazed tools. These grades or their equivalents have been standardized and are now specified for all high velocity machining.

Since chip control and chip removal from the machine is an important factor in cost reduction, chip breaker design was studied. A constant feed rate of 0.0142 in. for all pieces was decided upon as the most economical in terms of tool life surface finish. Since metal removal was fairly constant, the depth of cut was assumed to be the same for all pieces. These factors presented a uniform chip cross section to the cutting tool at all times. Varying either the depth or width of a chip breaker changed the chip formation, so an arbitrary depth of 0.015 in. was chosen for all chip breakers. It was then necessary to determine only the best width of chip breaker for the type control desired.

Chip shape v. tool life

In Fig. 1 several types of chips are shown with the width of chipbreaker which produced them. Type "A" gave poor tool life and was time consuming. Type "B" chips gave good tool life but tended to pack up in chuck jaws and other components of the machine. Type "D" chips, due to the drastic deformation, increased cutting forces to a point where tool life decreased appreciably. They also tended to go into color denoting excessive heat which reduced tool life. Type "C" chips were found to be the most desirable. They were easily removed from the machine, washed away from the work area readily, remained in the "white" chip range, and caused tool life to compare favorably with type "B."

Therefore, for 52100 material, a chip breaker of 0.015 in. depth x 0.080 in. wide cutting 3/16 in. depth of cut produced type "C" chips. Photomicrographs shown in Fig. 2 show the drastic deformation of a type "D" chip while a smooth, undeformed grain flow is shown for a desirable type "C" chip.

Hundreds of pieces were cut to determine tool life tests using different cutting tool clearances. The best tool life was realized with the angles shown in chart. No side rake angles are indicated since parallel chip breakers were used which after grinding resulted in neutral side rake. Further, a nose radius of 0.060 in. was used for all turning, boring, and facing cuts.

In determining the most satisfactory cutting fluid, several types were tried. A transparent water soluble oil with a wetting agent added showed the best results. The product as well as the machine was kept much cleaner, thus reducing maintenance. Cutting fluid was mixed to a ratio of 1 part soluble oil concentrate to 50 parts water. Although the artesian well water used was

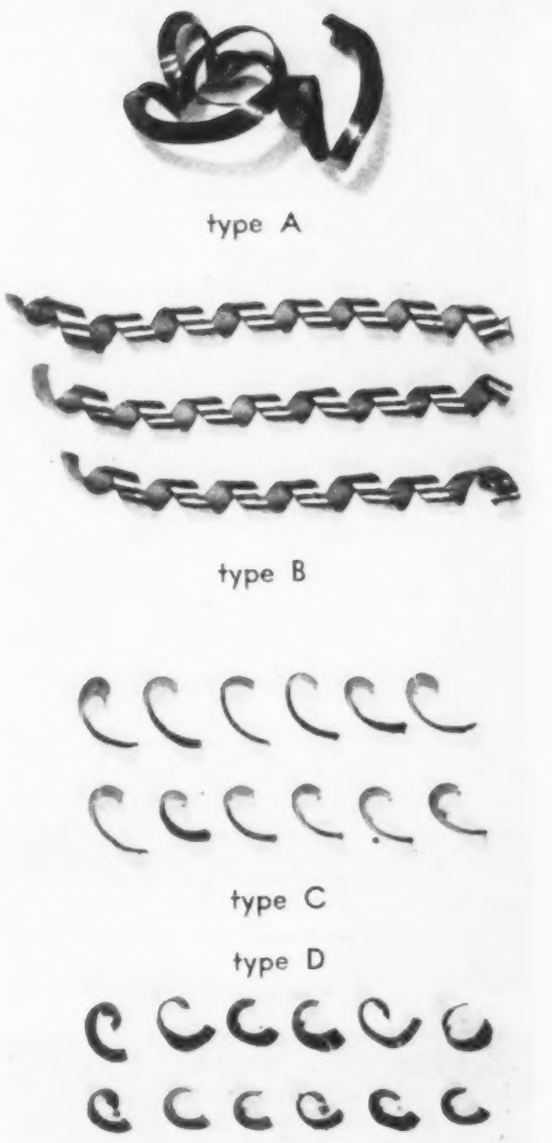


FIG. 1—Type of chips produced with different width chip breakers. Type "A" chip resulted from chip breaker 0.125 in. wide, type "B" from 0.100 in., type "C" from 0.080 in., and type "D", 0.060 in. Turning tool was K3H carbide.

TOOLING FOR LONGER LIFE

Rake or Relief	Operation	Tool Angle
Back Rake	Turning	7 °Negative
	Boring	Neutral
	Facing	5° Negative
	Forming	Neutral
	Chamfering	Neutral
Side Relief	Turning	5°
	Boring	5° Pri. 10 Sec.
	Facing	3°
	Forming	3°
	Chamfering	
End Relief	Turning	5° Pri. 10° Sec.
	Boring	10° Pri. Sec. as needed
	Facing	5° Pri. 10° Sec.
	Forming	0.5° Pri. 10° Sec.
	Chamfering	5° Pri. 10° Sec.
Side Cutting Edge	Turning	30°
	Boring	30°
End Cutting Edge	Turning	15°
	Boring	15°

"For single point brazed tools . . . 5 miles of chips could be expected . . ."

more economical than city water it showed under test to contain over 50 grains of soap hardness. Since this water "hardness" would diminish the effectiveness of the wetting agent, a commercial type water conditioner was added at the rate of 1 lb per 50 gal of cutting fluid mixture. After the addition of the water conditioner the total cost of the mixture containing artesian well water was less than the cost of untreated city water mixture.

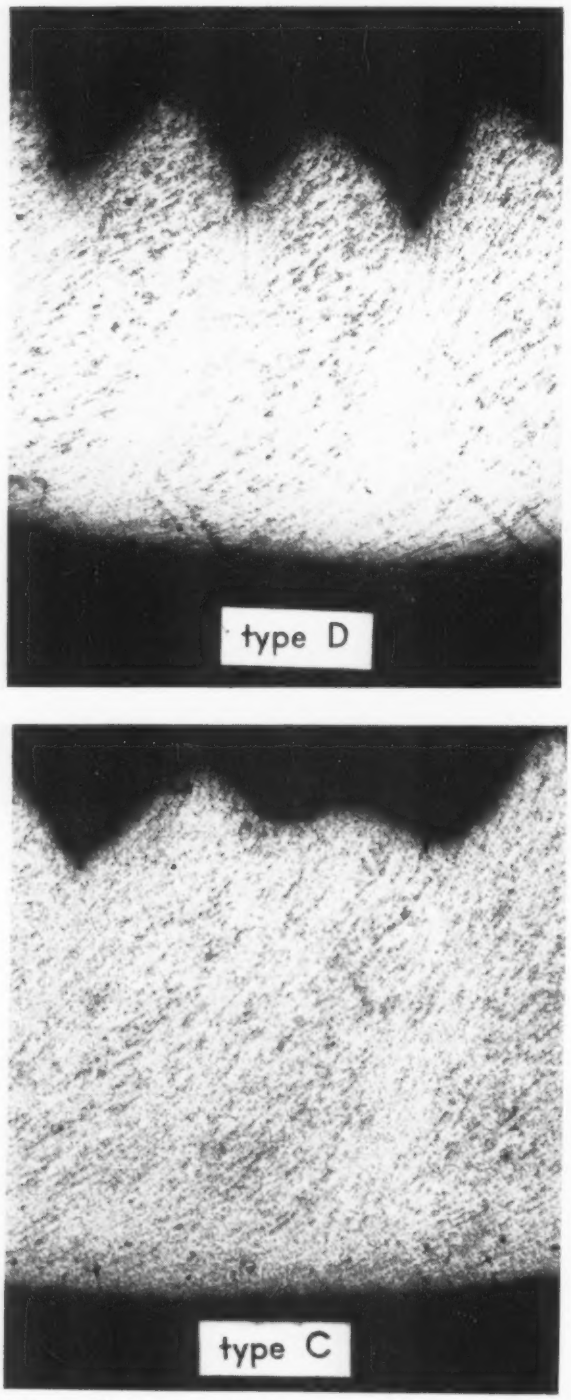


FIG. 2—Photomicrographs show drastic deformation of type "D" chip at top compared with favorable type "C" at cutting speed of 604 sfpm. Other conditions were the same as described in caption FIG. 1.

Tests showed that more than the standard cutting fluid pump capacity would be required. The pump was therefore specified to have an outlet volume rating of 75 gpm. Cutting fluid was transmitted to all necessary parts on the machine with ample volume and pressure. Tool bars were drilled to carry the cutting fluid with exits directly at the cutting edge of each tool both above and below. It was then possible to direct the flow of fluid under pressure between the interface of the cutting tool and the chip. The greatest amount of generated heat was thereby dissipated.

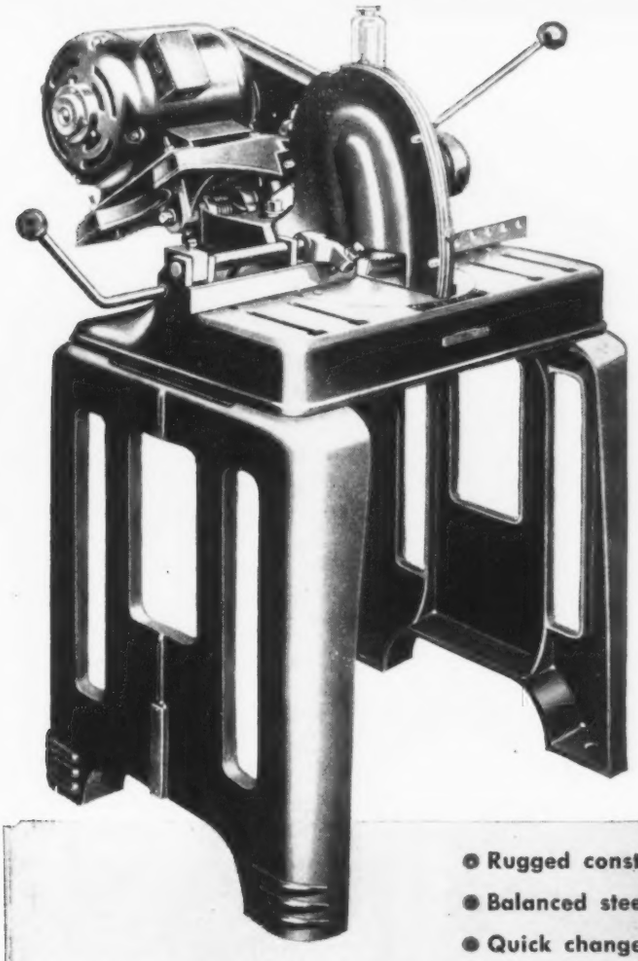
Due to the high rpm, chips, scale, and cutting fluid were thrown by the chuck and work piece with great force. Safety required the retention of all this material within the tooling area of the machine. This was accomplished through the use of fully enclosing hoods of sheet steel and clear plastic. The movable portion of the hoods was actuated hydraulically with the electrical controls operated by the machine cycle.

Safety lock used during cutting cycle

Hydraulically operated power chucks were used. This eliminated the extra expense of air installation since hydraulic power was already provided. Simple pushbutton control of the opening and closing of the chuck was installed with safety interlock to prevent operation during the cutting cycle.

In running tests, an arbitrary designation of miles of chips was adopted for tool life. This was possible since feed rate and depth of cut for all pieces were essentially constant. The tests showed that for single point brazed tools, approximately 5 miles of chips could be expected with a properly ground tool. This amounted to around 800 cu in. of metal removed per regrind. When mechanically held harder grades of carbide were used, an increase of 25 pct in metal removed per cutting edge per regrind was realized. This tool life was contingent upon maintaining a uniform Bhn 200 to 210 for all pieces. A constant check on these findings was made for a short time under production conditions. It was then possible to estimate the number of tools the operator should be changing for a given number of pieces machined.

In actual production, the cubic inches of metal removed per regrind was found to be slightly lower than that of the test operations due to the human error. However, many advantages of high velocity machining became very apparent. First, a greater number of pieces were produced in a given period of time. This resulted in lower machine overhead cost per piece. Capital investment cost per piece was reduced. Each piece cost less to produce in terms of labor. Closer tolerances and better finish were possible.



Cut steel, aluminum, copper and brass in one fast, easy motion with a

DELTA

Cut-Off Machine

- Rugged construction — heavy castings throughout
- Balanced steel pulleys
- Powerful 3-belt drive
- Quick changeover to handle ferrous or non-ferrous materials
- Timken roller pivot bearings, double-sealed arbor bearings require no lubrication

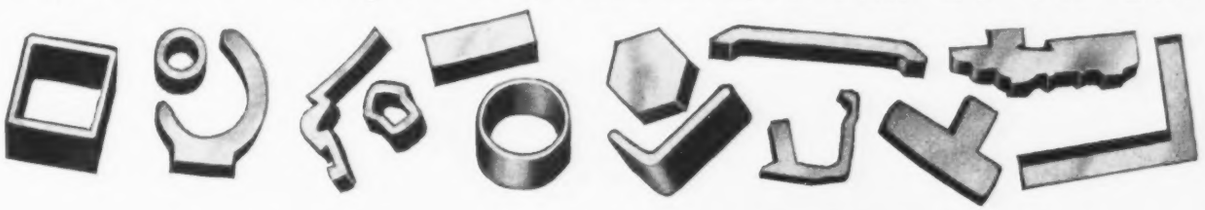
Smooth, clean cuts through steel by the abrasive wheel of the Delta Cut-Off Machine keep burrs to a minimum—frequently eliminates deburring. Easy, effortless cuts through non-ferrous metals leave a "polished smoothness". You see the benefits—speedier production, greatly reduced costs.

This versatile machine has literally hundreds of uses, such as cutting non-ferrous rod and tubing, old drills, mouldings, pipe and conduit, tool steel, steel tubing, rods, and wire rope—operations now being done by manual methods or on far costlier machines. It is also ideal for accurate high-production woodworking cut-off.

It will cut high speed or cold rolled steel bars or sections up to equivalent of $\frac{3}{4}$" solid round stock; and steel tubing up to $1\frac{1}{4}$" diameter with wall thickness of approximately $\frac{5}{32}$". On non-ferrous metals it cuts solid sections up to $1\frac{1}{2}$" diameter; tubular sections up to 2" diameter.

Maintenance costs are negligible.

Numerous shapes and materials can be cut off



For Delta dealers, see your Classified Phone Directory under "Tools"

There's a Delta Power Tool for Your Job-

WOOD OR METAL WORKING

53 MACHINES • 246 MODELS • MORE THAN 1300 ACCESSORIES

Another Rockwell Product

DELTA MILWAUKEE

DELTA POWER TOOL DIVISION

Rockwell

MANUFACTURING COMPANY

640M N. Lexington Avenue, Pittsburgh 8, Pennsylvania

Headquarters for

52100

Steel Tubing and Bars

Largest Stocks in the Country...

of this versatile steel. 52100 is hard, tough and long-wearing, yet it's easy to machine and is right for bearings, sleeves, pins, collars and many other machine parts.

Over 200 seamless tube sizes to choose from .898" O. D. to 8.250" O. D. Bar sizes from .171" round to 7.5" round. Also ring forgings in any analysis.

Write for our Latest Stock List Now

New Headquarters of Peterson Steels, Inc. Union, New Jersey

PETERSON STEELS, INC.

DEPT. I, SPRINGFIELD ROAD
UNION, NEW JERSEY

Detroit, Mich. • Chicago, Ill.

Technical Briefs

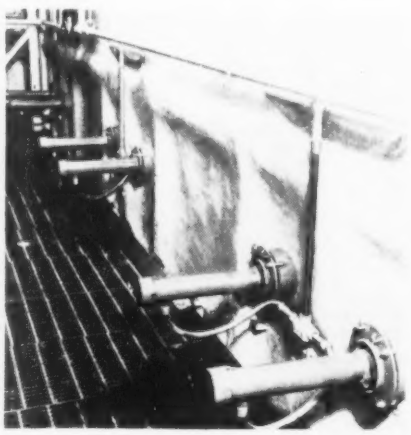
Engineering

SMOKE CONTROL:

Rapping unit improves efficiency of electrostatic precipitators.

Improved operation of electrostatic precipitators is possible with an improved rapping unit recently developed by Research Corp., Bound Brook, N. J., makers of Cottrell electrostatic precipitators.

Big problem with electrostatic precipitators has been the loading up of electrodes with particles removed from the stack. Stack shut-



MAGNETIC-IMPULSE rapping units installed in electrostatic precipitator prevent dust buildup on high tension discharge electrodes and collector plates. Precipitator efficiency is improved.

down, sometimes as often as eight times a day, has been necessary to clean the precipitators. The magnetic-impulse rapper is reported to eliminate the need for frequent shutdowns.

Power Supply—With the MI rappers, electrostatic precipitators can operate at maximum efficiency around the clock. They can rap both high tension discharge electrodes and collector plates from a common power supply source. The units deliver continuous rapping impacts of light and easily controlled intensities.

The rapper is designed for fly ash, gypsum, cement, iron cupola, electric furnace, open hearth and iron ore sintering furnace precipitators.

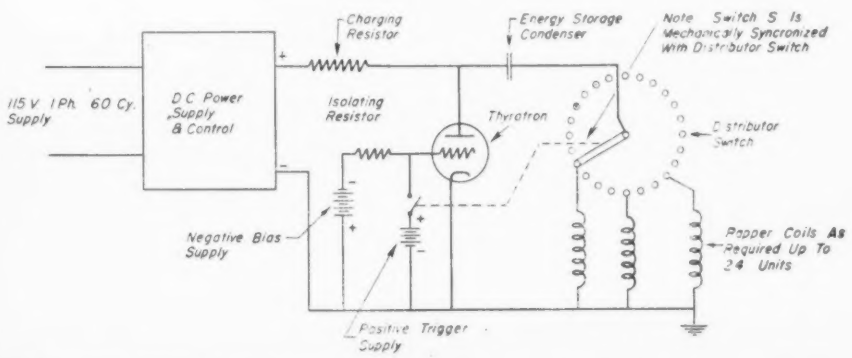
Plunger—Rapping element is a solenoid-actuated plunger, which can be easily installed on any standard electrostatic precipitator. A central pulse generator delivers tripping impulse to each of the rapping units at intervals of 1 minute or less for entire precipitator.

Power consumption is low—300 watts for up to 24 rapping units per precipitator. A separate remote control unit permits monitoring of the rappers from any convenient plant location to eliminate need for regular operating personnel.

Lower operating costs and low power capitalization costs are indicated. Automatic controls require no labor and almost no supervision.

IF YOU WANT MORE DATA

You may secure additional information on any item briefed in this section by using the reply card on page 135. Just indicate the subject heading and the page on which it appears.


Charging Resistor
Energy Storage Condenser
Note Switch S Is Mechanically Syncronized With Distributor Switch
115 V. 1 Ph. 60 Cy. Supply
D.C. Power Supply & Control
Isolating Resistor
Thyratron
Distributor Switch
Negative Bias Supply
Rapper Coils As Required Up To 24 Units
Positive Trigger Supply

SCHEMATIC CIRCUIT of the magnetic impulse rapper. Continued rapping eliminates need for periodic power shutoffs to clean discharge electrodes.

MACHINE REPAIR:

High priced compressor piston salvaged at low-cost, quickly.

Uncertain delivery and the high cost of replacement recently posed a production problem for a large chemical company. A local machine shop solved the problem by Metallizing the pistons, then machining them to proper size.

Kanawha Tool & Die Co. of Charleston, W. Va., salvaged the compressor pistons. Rods are 5¼ in. alloy steel and wear 2½ ft on either side of the centrally located 19 in. pistons.

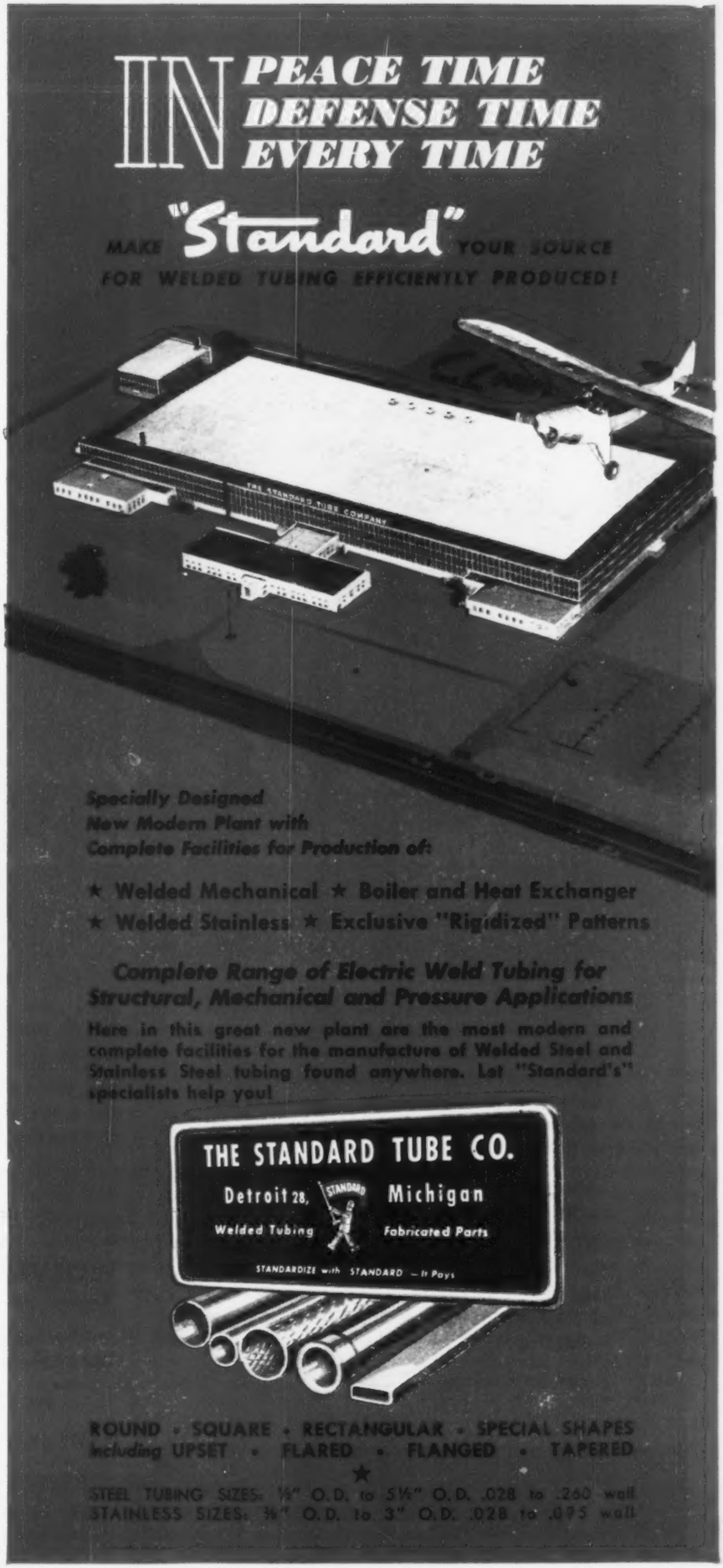
Surface Preparation — Here's how the job was done. The rods are first turned down approximately 0.100 in. on the radius, threaded with a fine U-type thread and then prepared with a special surface

COMPRESSOR PISTONS used in chemical plant were salvaged by hogging out worn shaft on either side of main piston, then spraying with stainless steel. Shafts were sprayed oversize and machined to proper dimensions.

roughing tool. This produces a surface somewhat similar to knurling.

The prepared surface is then sprayed with a special stainless alloy to about 3/32 in. over the original diameter. Rod is then ground to required dimension. Replacement cost for these piston rods runs about $1000 to $1200 each, with delivery very uncertain. A unit is back in service in 2 days.

Turn to Page 192


IN PEACE TIME
DEFENSE TIME
EVERY TIME
MAKE "Standard" YOUR SOURCE
FOR WELDED TUBING EFFICIENTLY PRODUCED!
Specially Designed
New Modern Plant with
Complete Facilities for Production of:
★ Welded Mechanical ★ Boiler and Heat Exchanger
★ Welded Stainless ★ Exclusive "Rigidized" Patterns
Complete Range of Electric Weld Tubing for
Structural, Mechanical and Pressure Applications
Here in this great new plant are the most modern and complete facilities for the manufacture of Welded Steel and Stainless Steel tubing found anywhere. Let "Standard's" specialists help you!
THE STANDARD TUBE CO.
Detroit 28, Michigan
Welded Tubing
Fabricated Parts
STANDARDIZE with STANDARD — It Pays
ROUND • SQUARE • RECTANGULAR • SPECIAL SHAPES
Including UPSET • FLARED • FLANGED • TAPERED
STEEL TUBING SIZES: ⅛" O.D. to 5½" O.D. .028 to .260 wall
STAINLESS SIZES: ¾" O.D. to 3" O.D. .028 to .095 wall

This kind of compactness

· Saves Space · Reduces Costs · Increases Efficiency

Many existing products, like heat exchangers, evaporators and condensers, can now be redesigned to smaller dimensions, thereby saving valuable space without affecting their present operating efficiency (as a matter of fact, some have *increased* their efficiency) by using Wolverine Trufin*—the integral finned tube.

Engineers see the new opportunities it gives them to design their products with more compactness—and even streamlining.

Trufin is available in many metals: copper, aluminum, copper base alloys, steel, etc.—in a variety of fin spacings, fin heights, and sizes. Trufin is also available in bi-metal.

It can be fabricated or formed as easily as plain tube. Since the tube is all one piece the fins are not affected by vibrations or sudden temperature changes.

You should be interested in learning more about this unique finned tube. Write for our new brochure that gives you full description.

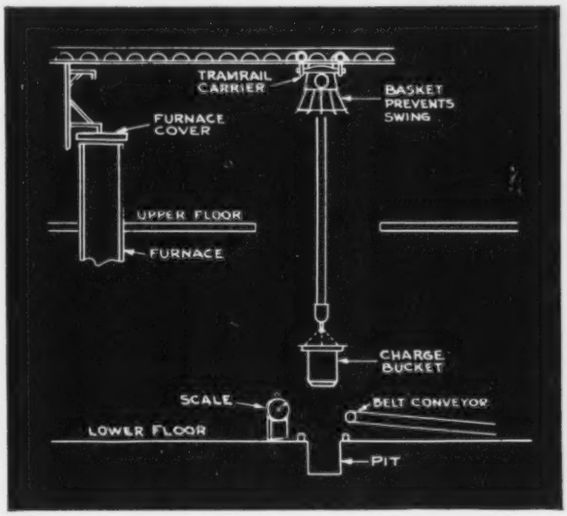
*REG. U. S. PAT. OFF.

WOLVERINE TUBE DIVISION
Calumet and Hecla Consolidated Copper Company
INCORPORATED
Manufacturers of tubing exclusively
1441 CENTRAL AVE. • DETROIT 9, MICH.
Sales offices in Principal Cities
PLANTS IN DETROIT, MICH. AND DECATUR, ALA.

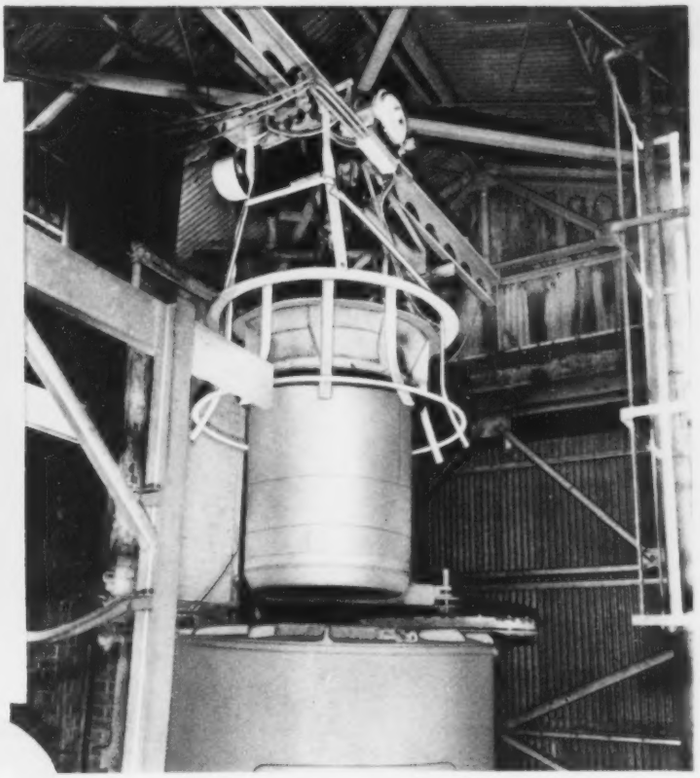
Wolverine Trufin and the Wolverine Spun End Process
available in Canada through the Unifin Tube Co., London, Ontario.

CLEVELAND TRAMRAIL

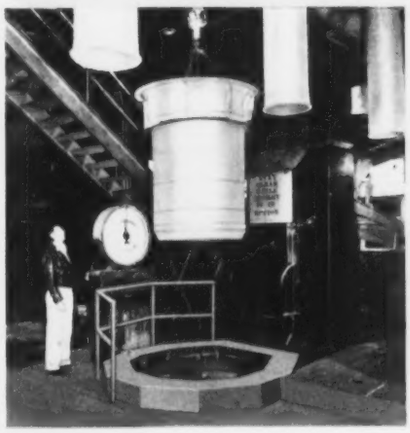
THE OVERHEAD TRACK TO



MELTING FURNACE



Carrier over furnace. As soon as it stops, bucket begins descent into furnace. Even furnace cover is swung away automatically by carrier bumper.



Charge bucket leaving scale to begin trip to furnace. Materials are fed into bucket by belt conveyor, while bucket is on scale in floor pit.

BUCKETS loaded with 2000 lbs. of charge materials consisting mostly of old battery plates are delivered from weighing scale to melting furnace, emptied and returned automatically by means of a Cleveland Tramrail Automatic Dispatch System. When a bucket is filled by a belt conveyor, pressing a push button sets the hoist and all succeeding movements in operation. After the bucket has reached high position and is firmly nested in the steel swing-prevention basket, the Tramrail carrier travels to the furnace. The bucket lowers into the furnace and is emptied. It then returns to the starting point and the cycle is repeated. The entire furnace-charging job is taken care of by a single man at the scale. This simple, easy method of furnace-charging is one example of the variety of ways Cleveland Tramrail Automatic Dispatch Systems are aiding many companies in different fields to raise plant efficiency, cut costs and improve safety.

GET THIS BOOK—Write for a free copy of Book 2008. Packed with valuable information, this well-illustrated book starts you thinking of ways you can step up production and lower costs in your plant

CLEVELAND TRAMRAIL DIVISION
THE CLEVELAND CRANE & ENGINEERING CO
4897 EAST 284th ST. WICKLIFFE, OHIO

CLEVELAND TRAMRAIL

THE OVERHEAD TRACK TO
Lower Production Costs

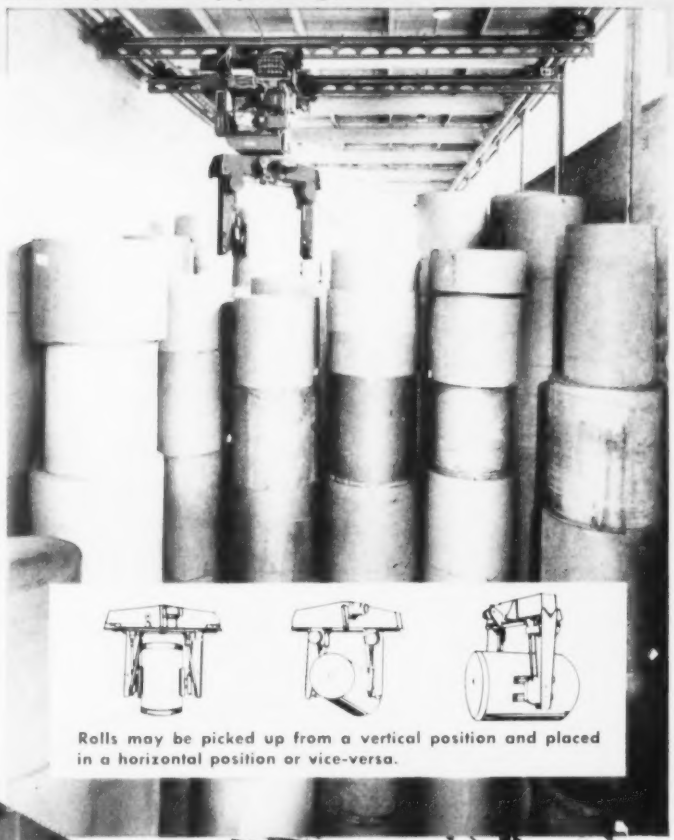
HANDLES COILS, REELS or ROLLS *Vertically* and *Horizontally*

EQUIPMENT especially developed for handling coils, reels or rolls on Cleveland Tramrail overhead track systems, with vertical-horizontal power-turn feature, offers you many advantages:

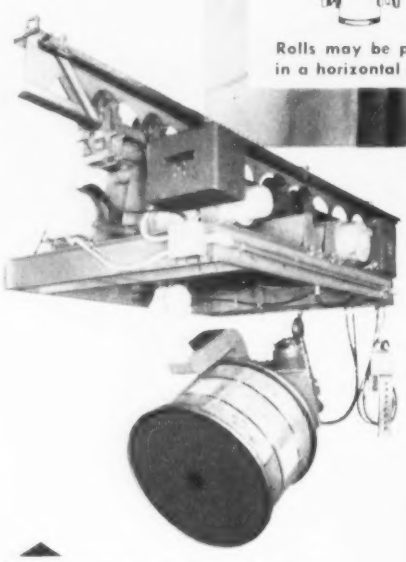
1. Permit full utilization of warehouse floor area for storage—no aisleways necessary.
2. Enable high piling—sometimes 40 feet and more.
3. As a result, warehouse capacity can often be increased from 50% to 150%.
4. Cost of building for amount stored is lowest possible. Building height can be increased at a fraction of the cost for enlarging floor area to obtain equivalent cubic storage space.
5. Handling materials in or out of storage is speeded because they are readily accessible without need of moving other materials.
6. Deliveries can be made directly to warehouse from incoming conveyance, or from warehouse to point of manufacture, on Tramrail carrier with no time-consuming, in-between handling.
7. Safety is improved because workers are usually removed from the load and heavy manual lifting and moving are eliminated.
8. Drastically cuts handling and storage costs.

Regardless of what materials must be handled in your plant, whether steel, copper, paper, cloth, etc., most likely a proper Cleveland Tramrail installation will prove of tremendous help to you as it has for thousands of other users. A nearby Cleveland Tramrail representative will be glad to go into the details.

6000 lb. rolls of paper are easily handled in any position with the Cleveland Tramrail motorized roll grab. One warehouse has piles to 42 feet high. Some users save 1% of all paper handled by reduction of paper damage.

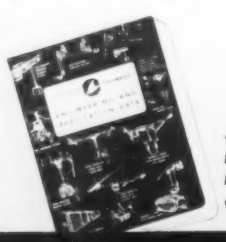


Rolls may be picked up from a vertical position and placed in a horizontal position or vice-versa.



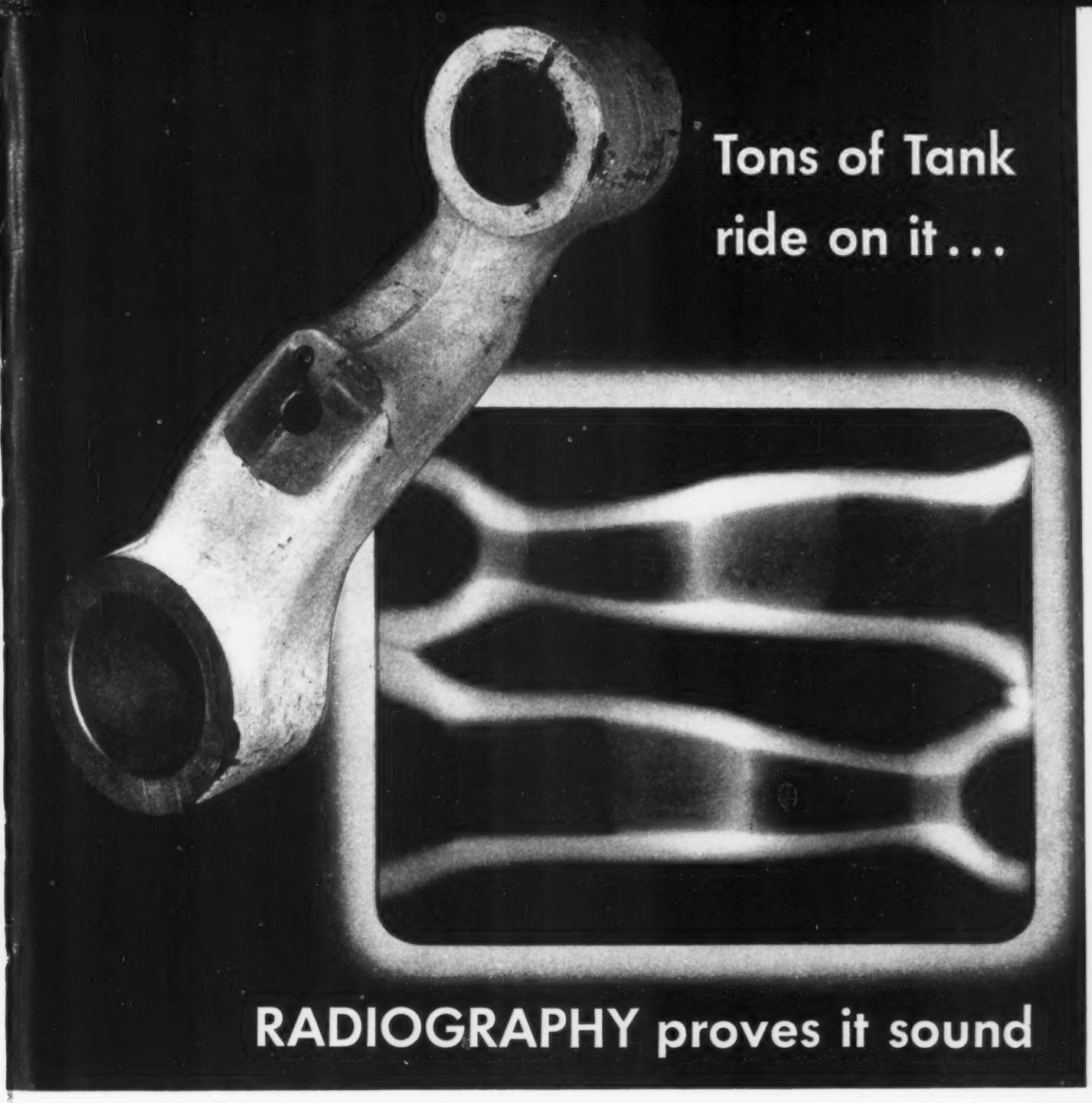
5000-lb. reels of copper wire, 26" wide by 40" dia. with 5" dia. core, are handled with this unit which turns from horizontal to vertical position.

10 coils of rod weighing 330 lbs. each are picked up at a time from horizontal position and placed in vertical storage to heights of 20 or 30 ft. with this unique grab and Tramrail carrier. No aisleways. One operator in crane cab does entire handling job.



GET THIS BOOK—Write for a free copy of Book 2008. Packed with valuable information, this well-illustrated book starts you thinking of ways you can step up production and lower costs in your plant

CLEVELAND TRAMRAIL DIVISION
THE CLEVELAND CRANE & ENGINEERING CO
4897 EAST 284th ST. WICKLIFFE, OHIO



It's the arm that carries the rear caterpillar track wheel of a tank. Failure would mean complete disablement—so soundness in the casting is a "must."

To make sure, the casting is radiographed. It's the one way to learn internal conditions without destroying the part.

Cases like this show why radiography is becoming routine in foundries everywhere. It helps earn a reputation for constant top-quality work—frequently suggests changes in operations that bring higher yields in production runs.

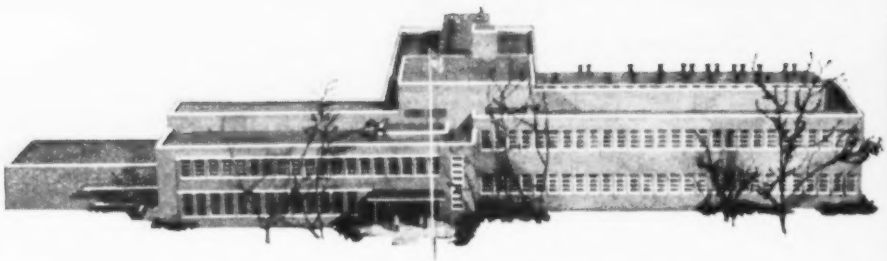
Your x-ray dealer will be glad to discuss ways radiography can increase your production. Get in touch with him. Also send for a free copy of "Radiography As A Foundry Tool."

EASTMAN KODAK COMPANY
X-ray Division, Rochester 4, N. Y.

Radiography...
another important function of photography

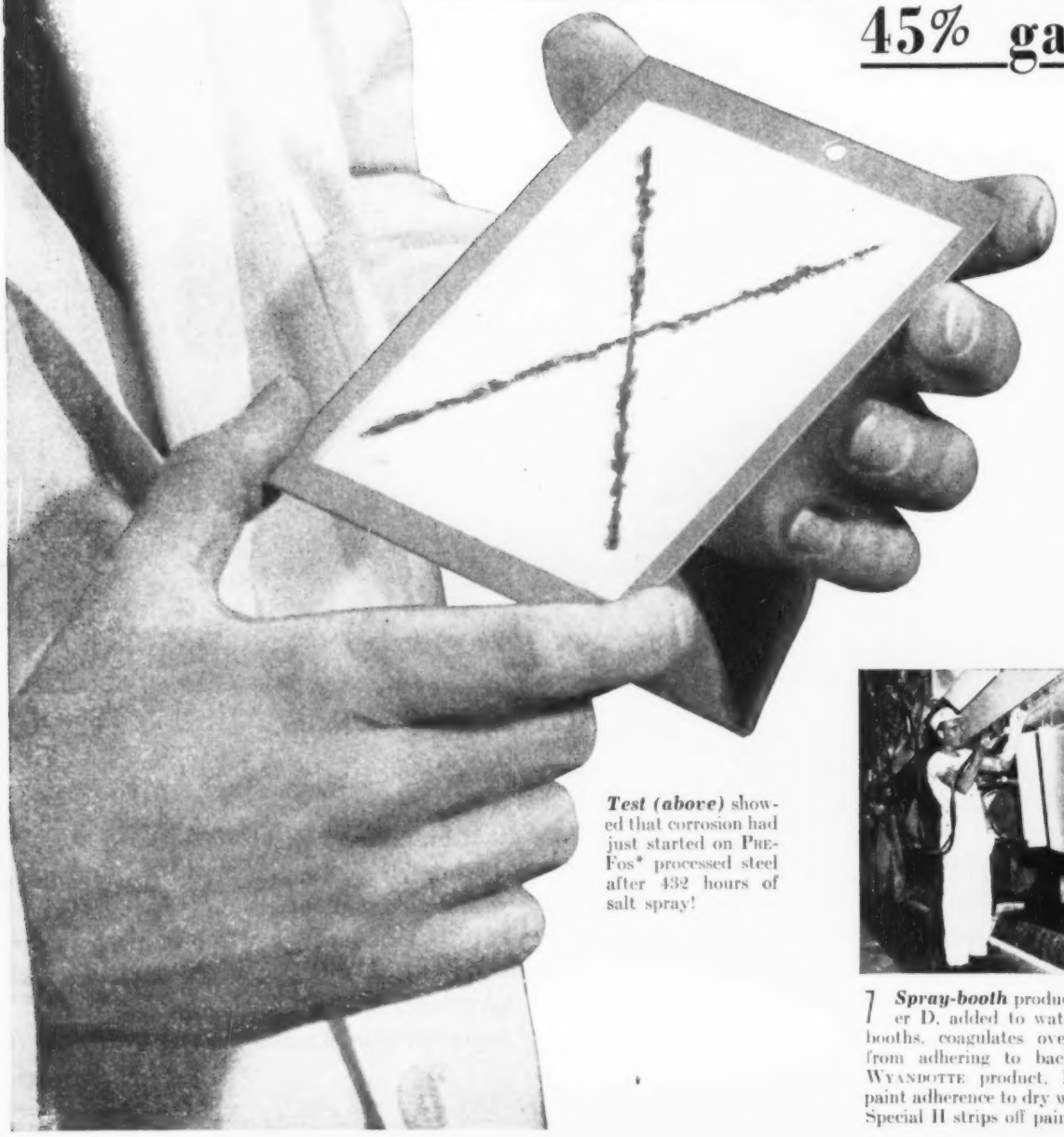
Kodak

WYANDOTTE
CHEMICALS

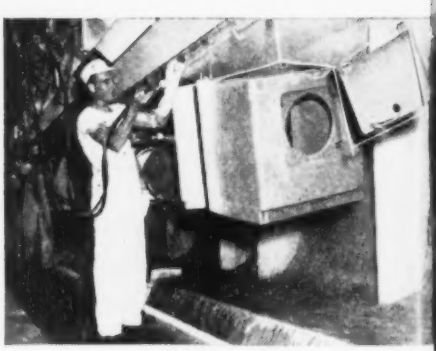


1 ***New*** WYANDOTTE CHEMICALS research building (above) houses finest facilities in the industry for testing and development of cleaning products and processes for Aviation, Railway and Metal Finishing Industries.

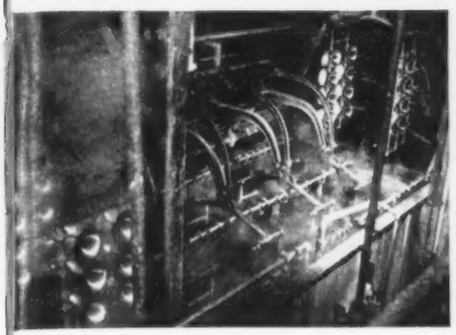
Read these FACTS behind 45% gain in



Test (above) showed that corrosion had just started on PRE-Fos* processed steel after 432 hours of salt spray!

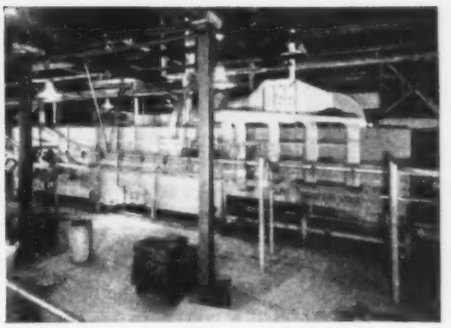


7 ***Spray-booth*** products: Metal Cleaner D, added to water in water-wash booths, coagulates overspray, keeps it from adhering to back wall. Another WYANDOTTE product, Hedral, prevents paint adherence to dry walls. WYANDOTTE Special H strips off paint.



2 ***Fewer rejects***—A parts manufacturer who uses WYANDOTTE F.S.* for electrocleaning of steel parts prior to electroplating, reported fewer rejects due to incomplete cleaning—calls F.S. "thorough and economical to use." You can profit, too, with WYANDOTTE products!

3 ***Wide line*** of cleaners includes W.L.G.,* a product with a balanced formula of exceptional detergency, long life, versatility (cleans copper, brass, bronze as well as ferrous metals). W.L.G. is also used for heavy soak-tank, barrel, and rotary-washer cleaning, low-pressure spray washing.



4 ***Power washing***—WYANDOTTE Metal Cleaner No. 38 puts added power in power washing machines . . . has high detergency, is used for cleaning ferrous and non-ferrous metals. Versatile, economical (through long solution life). Ask your helpful WYANDOTTE service representative to demonstrate.

Wyandotte's amazing cleaning product sales!

Wyandotte Chemicals is the leader—the world's largest manufacturer of specialized cleaning products for business and industry.

And Wyandotte sales climbed 45% in the past 2 years . . . are still going up, UP, UP!

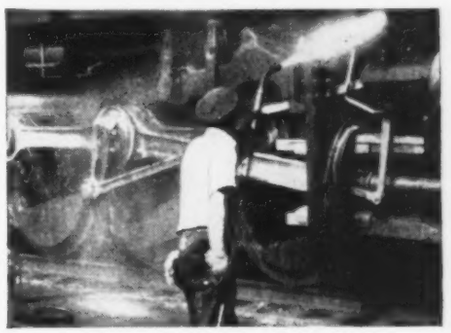
Why? Because more and more industries have learned that *with the leader, Wyandotte, they get advantages they could find nowhere else*: a complete line of high-quality products for every cleaning need; skilled technical service, and research most capable of solving *new* cleaning problems; dependable supply of raw materials from *our own* salt and coal mines and limestone quarries; more than half a century of the broadest possible cleaning experience . . . *all of which can save you money, give you better cleaning!*

May we help you? Write *Wyandotte Chemicals Corporation, Wyandotte, Michigan; also Los Angeles 12, California.*

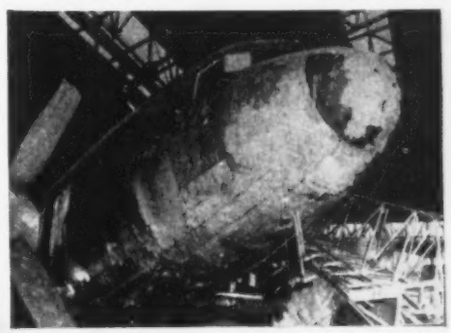
*REG. U.S. PAT. OFF.

Wyandotte CHEMICALS

Helpful service representatives in 138 cities in the United States and Canada



5 ***Railroad cleaning***—Products for every job include free-rinsing, solvent emulsion cleaner, WYANDOTTE-20. One of many WYANDOTTE railroad products, No. 20 does a uniformly fast, thorough job of flushing off heavy grease, oils. The WYANDOTTE line includes vat cleaners, interior and exterior car cleaners, waxes.



6 ***Aircraft***—WYANDOTTE line includes paint strippers (Sprazee), fuel-tank desealants, carbon removers, degreasers; brightening, polishing and corrosion treatments; conveyor power washing, vapor steam cleaning, exterior washing, and electrocleaners; aluminum cleaners and deoxidizers for spot-weld preparation.

8 ***For steam*** and hot-water pressure cleaning, WYANDOTTE supplies Fairtrex No. 1 for *medium*, and Special H for *heavy* deposits of oil and grease; Altrex*, a mild, noncorrosive product for light oils and grease. Complete line, too, for maintenance cleaning.

9 ***Floor absorbent***—Zorball is a really different product, almost mandatory wherever water, oil, grease, chemicals accumulate on floor. Doesn't break down, blow or track . . . remains skidproof when saturated . . . can be used again after drying. Prevents accidents. Saves dollars.

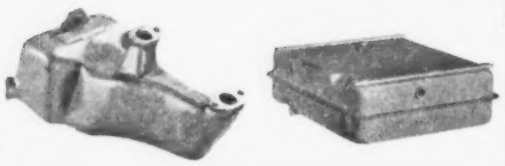
CLEANING THE WORLD

World's largest manufacturer of specialized cleaning products for business and industry

SHEET METAL FABRICATED TO YOUR SPECIFICATIONS

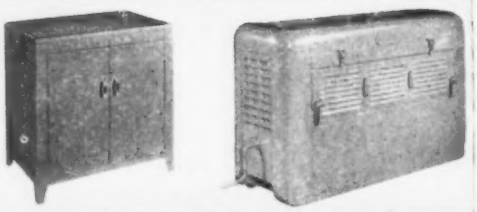
TANKS

All shapes
All sizes
1 qt. to 150 gal.



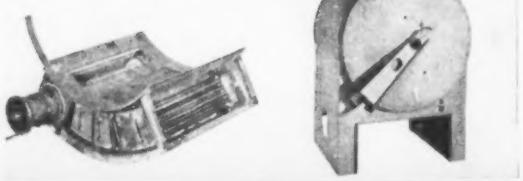
ENCLOSURES

Cabinets
Housings
Cabs



ASSEMBLIES

Ready to take their place on your equipment



SHEET METAL fabricated to customer's individual specifications. Flexible and diversified facilities are yours without capital investment.

It Pays To Make
STOLPER
Your Sheet Metal Department

STOLPER STEEL PRODUCTS CORPORATION
328 PILGRIM ROAD, MENOMONEE FALLS, WISCONSIN (MILWAUKEE DISTRICT)

—Technical Briefs—

ALUMINUM PANELS:

Thule Air Base keeps Arctic cold out with unusual insulator.

Aluminum panels, kept Arctic cold out and store heat in the barracks and other buildings at the Thule Air Base in northern Greenland. The base is only 900 miles from the North Pole.

The problem was one of reverse refrigeration: How to keep out Arctic temperatures (—60° F in winter) and maintain normal room temperatures. Even food "cold storage" lockers have to be kept heated up to 10° above zero.

Outside and In—Military authorities tried using aluminum panels outside and in for these Arctic structures. Insulating properties of aluminum, plus its lightness, were deciding factors.

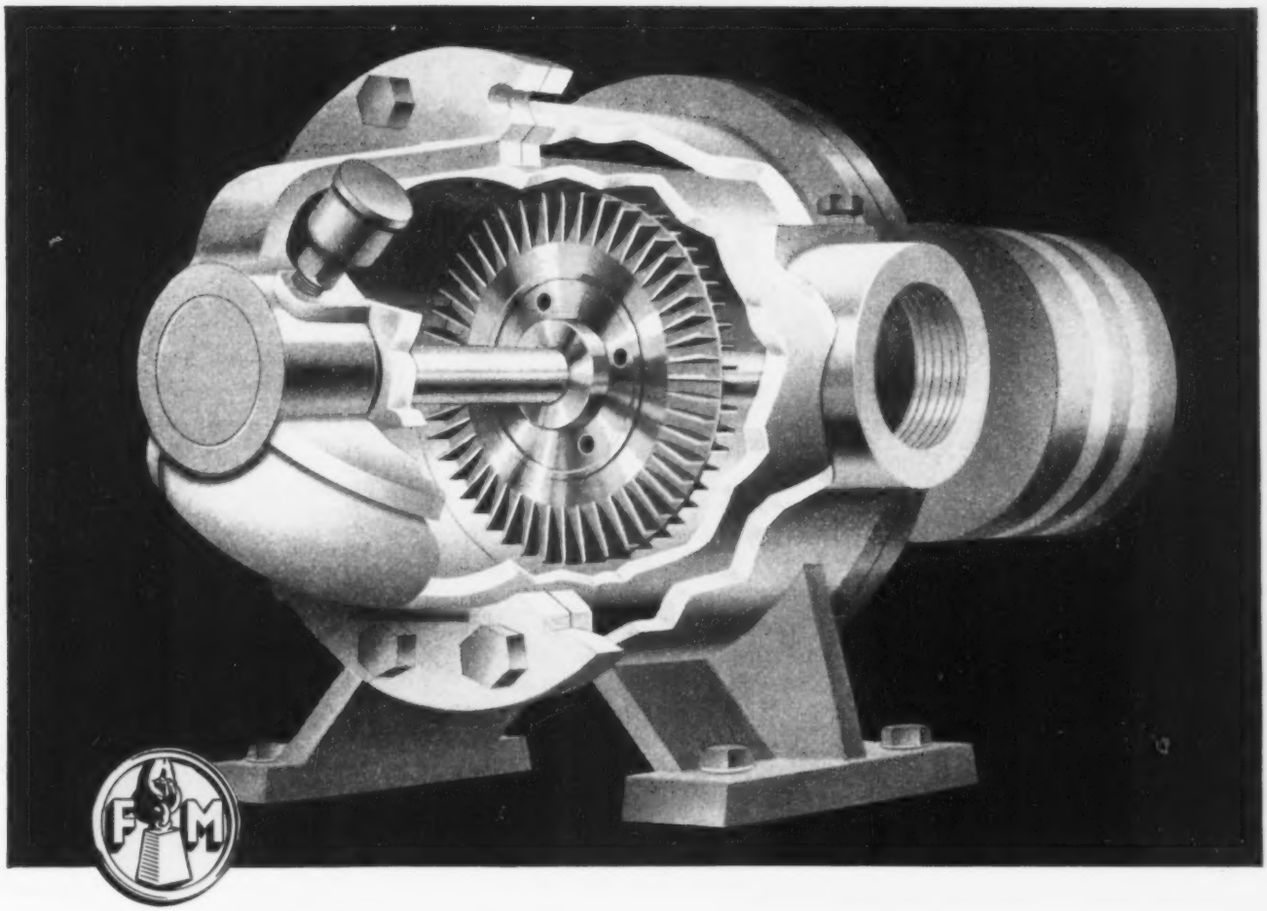
Aluminum's lightness simplified transportation of materials and equipment to the Air Base in northern Greenland. The aluminum panel was found strong enough to take the 150 mph winds in the region.

Special Design—A variety of designs and material combinations were tested. The panel chosen has an outer layer of sheet aluminum bonded to plywood and is mounted on 2 in. x 4 in. framing. An inner panel of aluminum and plywood with a filler of fiberglass insulation in between the two panels.

The outer aluminum sheet acts as a vapor barrier, thereby keeping out the cold, while the aluminum wall surface keeps the heat in.

Turn Page

"Jim's on vacation. That's how he wants to spend it."



Its heart is its one moving part

With castings in quality as well as in quantity, National Bearing Division helps its customers make better products.

When a leading pump manufacturer entrusts National Bearing Division with producing vital pump components, and producing them to the exacting standards required, there are some important reasons why.

This Fairbanks, Morse Turbine Pump combines high pumping efficiency with low pumping costs . . . thanks to close-fitting, precision-machined bronze liners and impellers that are easily replaced on the job, at a big saving over new housings.

These castings—particularly the impeller—have to be "right" . . . free from blow-holes, sand inclusions . . . and must be exceptionally fine-grained. Otherwise lost machining time, before defects are found, can seriously increase production costs.

National Bearing Division was picked to supply castings for the very heart of this Fairbanks, Morse Turbine Pump . . . because of an often demonstrated ability to mass-produce non-ferrous castings to a high standard of uniformity and quality.

If your product requires non-ferrous components, it will pay you to investigate National Bearing Division. We have the foundry facilities and skills that can make important contributions to your product performance . . . with castings in quality as well as quantity. The end result may well save you money, too!

Brake Shoe

NATIONAL BEARING DIVISION

4923 Manchester Avenue • St. Louis 10, Mo.

PLANTS IN: ST. LOUIS, MO. • MEADVILLE, PA. • NILES, OHIO • PORTSMOUTH, VA. • ST. PAUL, MINN. • CHICAGO, ILL.

—Technical Briefs—

ANALYSIS:

Minute quantities of elements identified in thin films.

A new approach to identification and quantitative analysis of minute amounts of elements present in very thin film or small deposits has been developed recently by the Research & Control Instruments Div., North American Philips Co., Inc., Mount Vernon, N. Y.

In laboratory tests dealing with thin films on stainless steel and component metals deposited on plastic and metal base materials, coatings of 6 micrograms per square centimeter or less are readily identified.

The technique easily and quickly determines percentages of chromium and nickel present in a specimen of 18-8 stainless steel where one square centimeter of the film actually contains about 1 microgram of chromium and less than ½ microgram of nickel.

Analyzing Crystal—Instrumentation consists of a standard X-Ray Spectrograph employing tungsten radiation, but using a special analyzing crystal with newly developed optics.

Each specimen is scanned with the X-Ray Spectrograph and the spectrum recorded through an angular range suitable for the particular elements involved. Intensity measurements are made with the scaler and a fixed count operation.

By comparing known weights of elements present with the counts-per-second the new technique provides an accurate means for measuring microscopic quantities.

Non-destructive — The method has a distinct advantage over former techniques, since it is non-destructive. Films are not ruptured or decased, as would be the case with spark spectrographs.

In industrial processing, there are distinct potentialities for evaporation control through rapid analysis of rates of deposits from solvents, for example, or through check on tiny quantities of condensate. Flash coatings, used for pro-

Turn Page

ATLANTA, Ga., Alpine 4885
Morrison-Drabner Steel Co., Inc.
BALTIMORE, Md., Peabody 7300
Hill-Chase Steel Company of Maryland
Asheboro, N.C.: Phone 8849
Richmond, Va.: Phone 7-4573
BEAUMONT, Tex., Phone 4-2641
Standard Brass & Mfg. Co.
CHICAGO METROPOLITAN AREA
Korhumel Steel & Aluminum Company
Evanston, Ill.: Ambassador 2-6700
CINCINNATI, Ohio, Wabash 4480, 4481
Morrison-Drabner Steel Co., Inc.
CLEVELAND, Ohio
Nottingham Steel Company
Atlantic 1-5100
Copper & Brass Sales, Inc.
Endicott 1-6757
DALLAS, Tex.
Delta Metals, Inc.
Hunter 7446
Earle M. Jorgensen Co.
Riverside 1761
DAVENPORT, Iowa, Phone 3-1895
Nichols Wire & Aluminum Co.
DETROIT, Mich.
Copper & Brass Sales, Inc.
Lorain 7-3380
HONOLULU, T. H., Phone 5-2541
Permanente Cement Co.
HOUSTON, Tex.
Standard Brass & Mfg. Co.
Preston 1123
Earle M. Jorgensen Co.
Orchard 1621
INDIANAPOLIS, Ind.
F. H. Langsenkamp Company
Imperial 4321
Korhumel Steel & Aluminum Company
Franklin 5361
KANSAS CITY, Mo., Victor 1041
Industrial Metals, Inc.
LOS ANGELES, Calif.
Eureka Metal Supply Company
Mutual 7286
Earle M. Jorgensen Co.
Lucas 0281
Reliance Steel Company
Adams 6133
MILWAUKEE, Wis., Evergreen 4-6000
Korhumel Steel & Aluminum Corp.
of Wisconsin
MINNEAPOLIS, Minn.,
Korhumel Steel & Aluminum Company
Gladstone 5943, Prior 4030
NEW ORLEANS, La.
Orleans Steel Products Co., Inc.
Raymond 2116
Standard Brass & Mfg. Co.
Aud. 1353
NEW YORK METROPOLITAN AREA
A. R. Purdy Co., Inc.
Lyndhurst: Rutherford 2-8100
New York: Chelsea 3-4455
Newark: Humboldt 2-5566
OAKLAND, Calif.
Gilmore Steel & Supply Company
Glencourt 1-1680
Earle M. Jorgensen Co.
Higate 4-2030
OMAHA, Nebr., Atlantic 1830
Gate City Steel Works
ORLANDO, Fla., Phone 7124
Profile Supply Company
PHILADELPHIA, Penna., Delaware 6-5400
Hill-Chase & Company, Inc.
Allentown: Allentown 28077
York: York 5790
PHOENIX, Ariz., Phone 8-5331
Arizona Hardware Co., Inc.
PITTSBURGH, Penna., Hemlock 1-5803
Follansbee Metal Warehouses
PORT ARTHUR, Tex., Phone 5-9377
Standard Brass & Mfg. Co.
PORTLAND, Ore., Tuxedo 5201
Eagle Metals Inc. of Oregon
SAN FRANCISCO, Calif., Klondike 2-0511
Gilmore Steel & Supply Company
SEATTLE, Wash., Lander 9974
Eagle Metals Company
SHREVEPORT, La., Phone 2-9483
Standard Brass & Mfg. Co.
SPOKANE, Wash., Madison 2419
Eagle Metals Company
ST. LOUIS, Mo., Lucas 0051-2-3
Industrial Metals, Inc.
WICHITA, Kans., Phone 7-1208, 7-1209
General Metals Incorporated
WORCESTER, Mass., Worcester 7-4521
Merrill Aluminum Corporation

You file his name under Service

GOOD reason for keeping in close touch with your Kaiser Aluminum Distributor is the *extra service* he makes available to you.

He gives your order personal attention, whether the market is soft or tight, the job large or small. He learns your problems, suggests solutions based on his specialized knowledge and experience handling countless problems *like* yours.

He investigates new methods to help you get more from available supplies. For experimental work, and for emergencies, he helps you obtain supplies. Often he assists you in securing subcontracts by keeping you posted on continually changing government requirements.

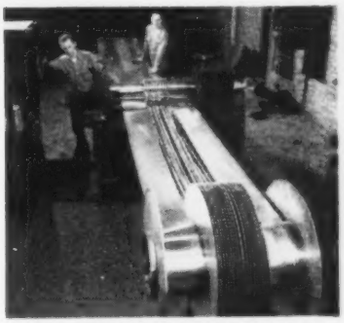
Even now, he may be able to supply all the aluminum you need. For Kaiser Aluminum will soon have increased its production of primary aluminum 137%.

See your Kaiser Aluminum Distributor *soon*.

HERE'S HOW YOUR DISTRIBUTOR HELPS YOU:

MORE VERSATILE INVENTORY—Large stocks maintained by your warehouse distributor give you the opportunity to select from a complete range of alloys and form.

LOWER COSTS—Specialization of warehouse plant and handling equipment permits deliveries at lower cost at machine side, cuts stock keeping and accounting costs.



LOWER RAW MATERIAL INVESTMENT—Slit, sheared, or sawed stocks to fit every production demand can be delivered to you daily. Eliminates expense of idle or obsolete inventory.

SMALLER SPACE REQUIREMENTS—Small lot purchases mean less space is needed to house raw materials. Result: you can devote more space to profitable production.

Kaiser Aluminum

Setting the pace . . . in growth, quality and service

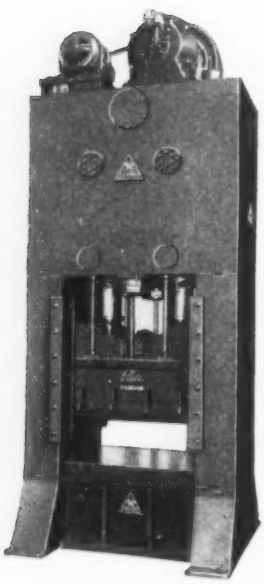
PRODUCERS OF: Sheet • Coil • Plate • Pig • Ingot • Billet • Foil • Electrical Conductor Residential Siding • Corrugated Farm and Industrial Roofing • Shade Screening • Rod, Wire & Bar Screw Machine Stock • Forging Stock • Rivet Wire • Roll-Formed Shapes • Extrusions

"streamlined" is the word for Alice

She's just a white-collar girl—an office secretary—but if you're an American manufacturer you'd better keep an eye on Alice Porter. Whether your product is used in the office or the home, the nod of her blonde head controls your cash register.

Typewriters, files, vanity cases or pots and pans—Alice likes 'em streamlined. That means smooth, light in weight, strong without bulk. And *that* means (although Alice doesn't know it) produced on presses.

Up-to-date press methods cater to popular demands and reduce costs at the same time. Was there ever a better formula for expanding a market? It's no secret—your competitors know it, too. Get in touch with us to see how your product can be improved, and production costs cut, with one or more Clearing presses.



CLEARING MACHINE CORPORATION

6499 WEST 65th STREET • CHICAGO 38, ILL.

HAMILTON DIVISION, HAMILTON, OHIO

CLEARING PRESSES

THE WAY TO EFFICIENT MASS PRODUCTION

tective and decorative purposes can readily be controlled as to thickness, a process heretofore extremely tedious and difficult, as well as often inaccurate.

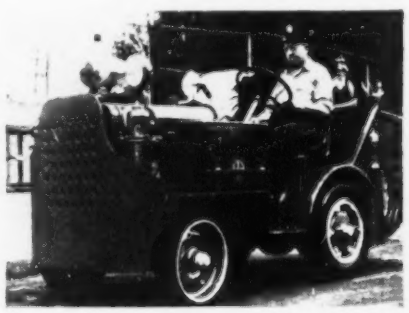
Machine Friction—A subject of great interest to aircraft, automotive and stationary engine designers — machine friction — may be more efficiently analyzed. Thin films which give clues to the transfer of metals or the formation of superficial alloys under heat and pressure may be detected. Degeneration of bearing surfaces due to chemical interaction with constituents of lubricants may be recognized.

FIRE TRUCK:

Compact fire unit travels plant aisles with greatest of ease.

A unique plant fire truck that can easily negotiate narrow factory aisles has been designed by plant protection officials of the Chevrolet General Motors in Baltimore.

The designers, Chief of Plant Protection Ray Wilder and Chief of Fire Prevention Walter Helm, equipped a Model C7-21 Clarktor mule with an Ansul S-150 dry

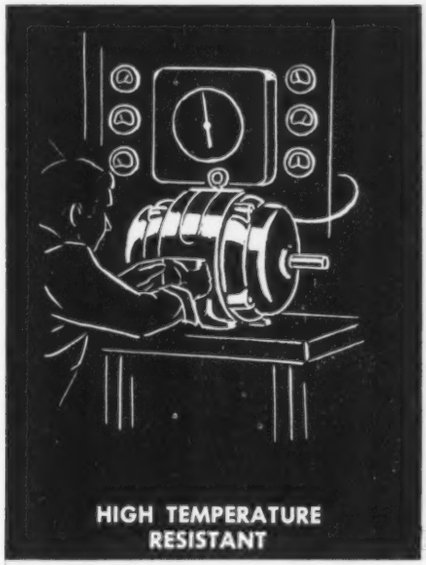


PLANT FIRE TRUCK built on Clarktor Mule easily moves through aisles of Chevrolet plant in Baltimore. Truck is equipped with Ansul dry chemical fire equipment.

chemical fire extinguishing unit behind the driver's seat. They also placed two Ansul 20-B hand extinguishers on each front fender.

The unit also carries a 20-ft extension ladder, an MSA Chemox breathing apparatus, rubber boots, rope, fire axes, siren, headlights, a powerful portable searchlight, a 50-lb carbon dioxide cylinder and a small vaporizing liquid type extinguisher.

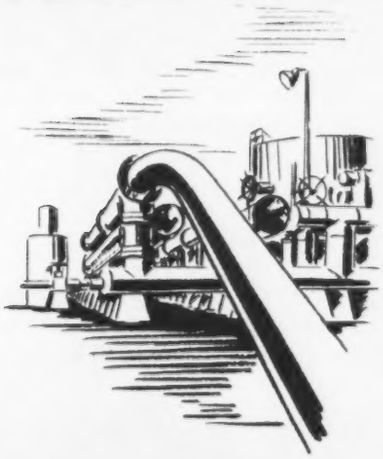
Turn Page



HIGH TEMPERATURE RESISTANT

LOW TEMPERATURE RESISTANT

OIL and GAS RESISTANT



CHEMICAL RESISTANT

PRECISION RUBBER PARTS

By Stalwart!

If you have a rubber part problem, see STALWART first! Leaders in the mass production of custom-engineered rubber parts, they can meet your individual requirements quickly and economically.

From more than 500 specially-developed stocks, including extreme temperature resistant Silicones, STALWART can fabricate precision molded, extruded, die-cut and machine or hand-cut parts. These parts will retain their desirable physical, chemical and dielectric properties under severe operating conditions and will give maximum performance in each specific application.

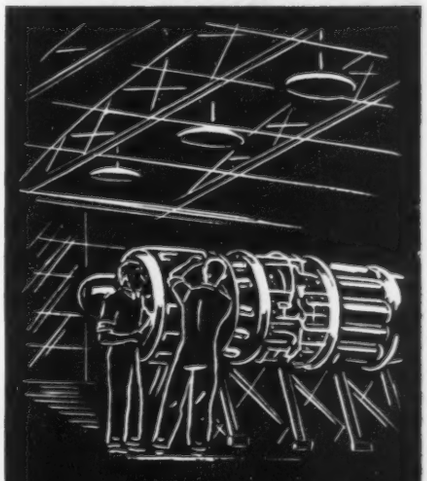
Let STALWART solve your rubber parts problems. Submit the specifications and STALWART will do the rest.

Write today for catalog 51SR-1 for complete information.

811-SR

WEATHER RESISTANT

ABRASION RESISTANT



EXTREME TEMPERATURE RESISTANT SILICONE

STALWART RUBBER COMPANY

200 NORTHFIELD RD. • BEDFORD, OHIO

WILLSON®
plastic protective equipment

keep you on the safe side

WILLSON MONOGOGGLES®

Workers wear Willson protective equipment willingly because these MonoGoggles® and other safety devices shown are lightweight and comfortable. MonoGoggles® illustrated above are available in flexible *Polythene* and fully transparent *Acetate* for extra side vision. Interchangeable lenses in clear plastic or Tru-Hue green. Ask for Willson—the leading line of respiratory and eye safety equipment for industry, farm and home use.

Choice of clear or green plastic visors

WILLSON PROTECTO-SHIELD®

gives full face protection with a choice of 4", 6" and 8" visors. Ideal for many industrial operations. Also available with full flare at sides for extra protection against chemical splash.

Weighs less than an ounce!

WILLSON FEATHERSPEC®

. . . specially designed for light-duty operations. Comfortably worn over prescription glasses. Their clear or Tru-Hue green plastic lenses can be switched in a few seconds.

See your WILLSON distributor or write for bulletin

WILLSON PRODUCTS, Inc., 231 Washington St., Reading, Pennsylvania

—Technical Briefs—

GAGING:

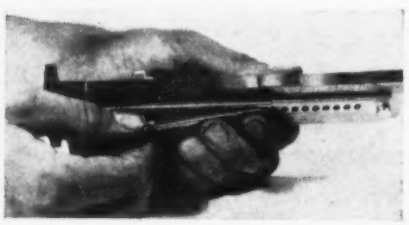
Combination gage block system versatile shop tool.

An unusual gage block system permitting a wide variety of measuring operations has been developed which extends the use of gage block accuracy. The system permits gage blocks to be taken out of the "vault" and be used as everyday tools.

Direct use of precision gage blocks for everyday gaging operations has been limited by mechanical difficulties involved in assembling the blocks into a practical measuring tool.

Problem — Difficulties in handling arise from the physical form of the gage block itself. Previous gage block holders and accessories have permitted only limited application.

To overcome these difficulties an unusual series of gaging items has been developed by The DoALL Co. Construction of gaging setups with U.S.A. type gage blocks and greater utility from gage blocks by permitting the construction of instruments for any gaging or scribing operation are possible.



WIDE RANGE of measurements and gaging operations are possible with an unusual set of precision blocks and clamps designed by DoAll.

The entire series constitutes a complete gaging system and is referred to as such.

Nucleus—Heart of the gaging system is a series of unique gage block holders and end standards. Holders permit setups up to 72 in. long in increments of as little as 0.000025 in.

End standards are functional gage blocks. They incorporate the working surfaces, gaging or scribing, needed for constructing mea-

Turn Page

A few words about

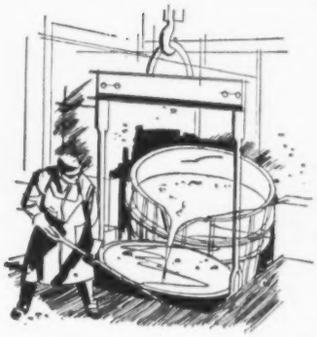
GRAINAL ALLOYS

In our Laboratories every aspect of Grainal Alloys is carefully studied.

and how they are

Metallurgically Engineered

to produce greater uniformity in your boron treated steels



In our Plant exacting methods of production protect the quality of Grainal Alloys.

Uniformity. Consistent Results.

These are the demands of today's steelmaker. To make certain they are answered, we have *metallurgically engineered* our Grainal alloys.

In our laboratories, in our plant, every care is taken to insure a product of the correct composition and highest quality.

Result: A uniform product that enables you to produce steels of consistently high hardenability And note—with Grainal you achieve this result with a minimum boron addition.

In your Mill, greater uniformity in your boron steels.

VANADIUM CORPORATION OF AMERICA

VANCORAM

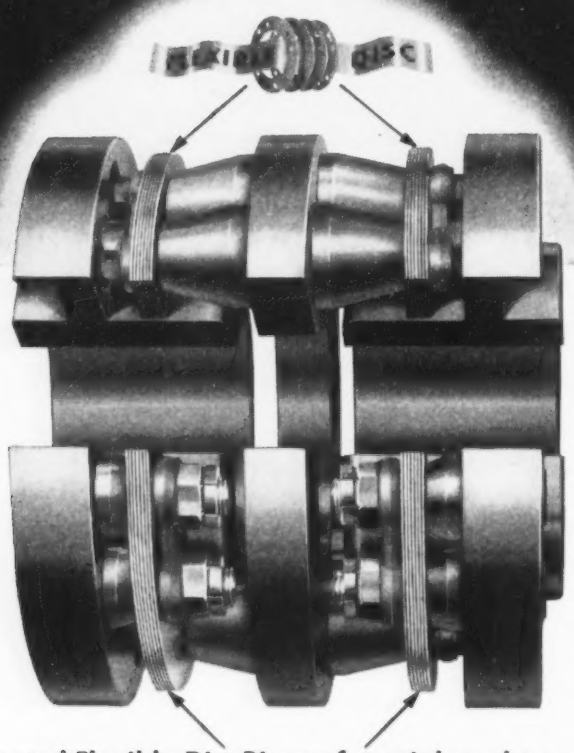
420 Lexington Avenue, New York 17, N. Y.
Detroit • Chicago • Cleveland • Pittsburgh

MAKERS OF ALLOYS, CHEMICALS AND METALS

AVOID COSTLY SHUT-DOWNS!

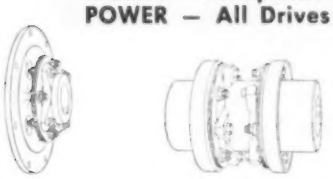
prolong the life of your machines with Thomas Couplings

DISTINCTIVE ADVANTAGES of THOMAS ALL-METAL COUPLINGS	
GREATEST ECONOMY	No Maintenance Pays for Itself
NO LUBRICATION	No Wearing Parts Human Element Eliminated
NO BACKLASH	All Parts Solidly Bolted No Loose Parts
CAN NOT "CREATE" THRUST	Free End Float under Load and Misalignment



Patented Flexible Disc Rings of special steel transmit the power and provide for parallel and angular misalignment as well as free end float.

SPEEDS — All Speeds up to 30,000 RPM.
POWER — All Drives up to 40,000 HP.



THE THOMAS PRINCIPLE GUARANTEES PERFECT BALANCE UNDER ALL CONDITIONS OF MISALIGNMENT.

MANUFACTURERS OF FLEXIBLE COUPLINGS ONLY FOR OVER 35 YEARS

Write for our new Engineering Catalog No. 51

THOMAS FLEXIBLE COUPLING COMPANY

WARREN, PENNSYLVANIA, U.S.A.

OVERSIZE indicating snap gage uses pre-calibrated dial indicator, extra long gage blocks and special holder to get quick, accurate measurements on machined surface of large casting.

suring instruments. Dimensions are within gage block tolerance.

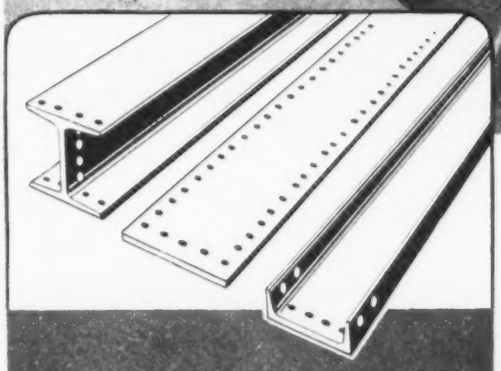
Wide Range—Channel-type holders in graduated sizes embrace a usable measuring range of from 2 to 72 in.

Gages are assembled by a unique detent pin arrangement. A captive type pin is employed at each end of every extension and base holder and the end standards are drilled to the diameter of this pin. An end standard is inserted in the holder and its hole aligned with the detent pin hole. The detent pin is pressed through the end standard to the opposite wall of the holder where it "snaps" into a lock bushing.

Slipped In — Gage blocks required to complete the desired dimension between the working surfaces of the end standards are slipped into the holder and the entire assembly is clamped together with a thumb screw mechanism.

Turn Page

...It's New ...It's Flexible ...It's Economical



This new Spacing Table-Beam Punch Combination handles beams, channels, angles and cover plates with a minimum of tool changing and maximum economy.

Built in various tonnages and lengths to meet your needs

. . . a motorized THOMAS Indicator Spacing Machine

designed for the smaller fabricating shop

THOMAS . . for years the leader in the development of spacing machines . . now offers a fitting companion to the famous Thomas Automatic, used in practically all major high-production shops. It's the Thomas Motorized Indicator Spacing Machine, specially designed with traditional Thomas quality features, to meet the needs of the smaller fabricating shop.

THE TREND IS TO THOMAS

PUNCHES · SHEARS · PRESSES · BENDERS · SPACING TABLES

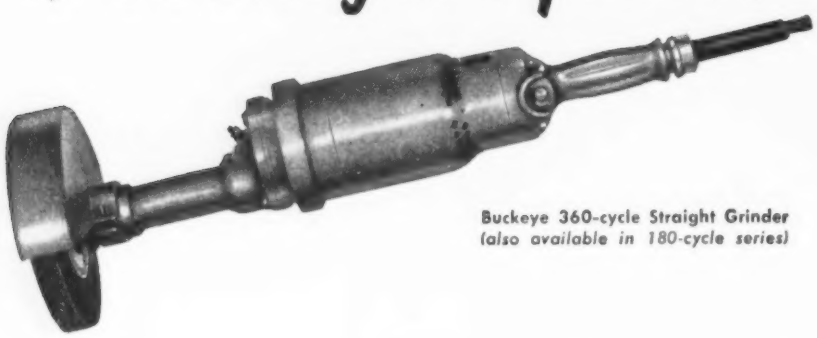
THOMAS
MACHINE MANUFACTURING CO.
PITTSBURGH 23, PA.

34

Buckeye 360-cycle Right Angle Sander
(also available in 180-cycle series)

▶ SAVE **$28.75**

▶ on every new pinion!



Buckeye 360-cycle Straight Grinder
(also available in 180-cycle series)

On all electric tools, the pinion gear is subject to wear and replacement.

On many electric tools, replacing an inexpensive pinion also requires replacing an expensive rotor.

On Buckeye electric tools, the pinion is detachable and is easily replaced without even disturbing the rotor and shaft, which are dynamically balanced to insure smooth, quiet operation.

In short, whenever you do have to replace a worn pinion, you can save $28.75, plus a great deal of maintenance time and effort—IF you're using Buckeye electric tools.

▶ what are you waiting for?

CATALOG E-10 *contains complete information and specifications on Buckeye 360 and 180 cycle portable drills, screwdrivers, nut-runners, straight and right-angle grinders, sanders, buffers, polishers.*

Buckeye Tools CORPORATION

DIVISION 11 • DAYTON 1, OHIO

Portable Air and Electric Tools for Industry

IN CANADA: Joy Manufacturing Co. (Canada) Ltd., Galt, Ontario

—Technical Briefs—

Pump Standard for Machine Tools

A new American Standard, Mounting Dimensions of Lubricating and Coolant Pumps for Machine Tools, B5.28-1952, has been approved by the American Standards Assn. The new standard contains tables of those dimensions of lubricating and coolant pumps that govern the mounting of such devices on machine tools.

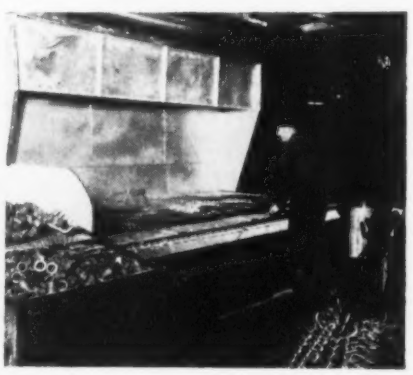
Adoption of the standard dimensions by manufacturers of the pumps will assure interchangeability, insofar as their assembly to the machine tool is concerned. Internal design of the pumps, which is left entirely to each manufacturer, will not be affected by the standardized mounting dimensions.

Stran-Steel Cuts Trailer Weight

Stran-Steel Div. of Great Lakes Steel Corp. has developed a new combination of lightweight materials that greatly decreases weight in highway freight trailer construction.

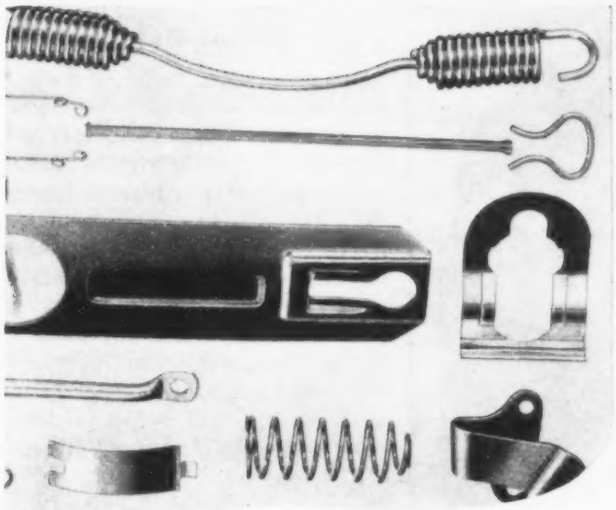
The new trailer construction consists of Stran-Steel flooring and an aluminum body. Roadway Transit Co. of Detroit has contracted for the first 50 units produced.

With highway weight limits under strict enforcement, weight savings which permit increased payloads have become the major concern of truck and trailer manufacturers.



MALLEABLE IRON fittings, at the rate of 3000 lb per hour, are galvanized in this direct-fired kettle setting designed and built by Surface Combustion. By using automatic proportioning velocity burners on low pressure gas, the molten spelter is held at a constant temperature of 850°F. Note special work handling fixtures.

Turn Page



COIL SPRING SAYS: We're Ready To Talk Turkey on your "Spring Needs"

Looking for a way to improve your product? Examine its spring parts—are they built for durable service, or just getting by? Are they produced for you economically? Exactly to specifications? Delivered on time? If you're not getting the spring service you need, U. S. Steel Wire Spring can help you. Just write or call.

No order too large or too small.

The U. S. STEEL WIRE SPRING Co.

7800 FINNEY AVE. • MICHIGAN 1-6315

CLEVELAND 5, OHIO

Hammond

HIGH PRODUCTION

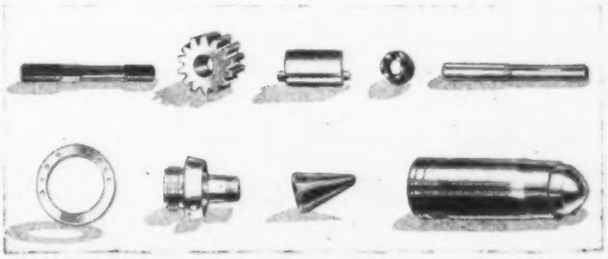
GRINDING

POLISHING, DEBURRING

ROTARY

AUTOMATICS

MODEL J-34 Arranged with 4 Heads



HAMMOND ROTARY AUTOMATICS are adaptable to a wide variety of parts—**Grinding, Polishing, Deburring.**

Send us one finished and several rough samples. You will receive a complete Engineering Report and Production Analysis without obligation.

Hammond Machinery Builders INC

1612 DOUGLAS AVENUE • KALAMAZOO, MICHIGAN

You're looking at a polished section cut from a Duraspun Centrifugal Casting...a casting with 12-14% chromium. It tells better than words of the high quality of Duraspun Centrifugal Castings.

You get a fine, dense, uniform grain structure. Possible air pockets and blow holes are eliminated. Tensile strength is higher than with static castings.

Order Duraspun if you need pipe or tubing. Sizes run up to 15 feet in length; up to 32 inches OD; and down to ¼ inch wall thickness. Odd shaped pieces can be produced providing a circular hole passes uniformly down the center. These, of course, require specially designed casting forms.

If, before ordering or asking us to quote, you would like to know more about our work and facilities, send for our Catalog 3150.

THE DURALOY COMPANY

Office and Plant: Scottdale, Pa. • *Eastern Office:* 12 East 41st Street, New York 17, N.Y.

Detroit Office: 23906 Woodward Avenue • Pleasant Ridge, Mich.

Atlanta: J. M. TULL Metal & Supply Co. Chicago: F. O. NELSON 332 S. Michigan Avenue San Francisco: JOHN D. FENSTERMACHER 1241 Taylor Street

METAL GOODS CORP.: Dallas • Denver • Houston • Kansas City • New Orleans • St. Louis • Tulsa

—Technical Briefs—

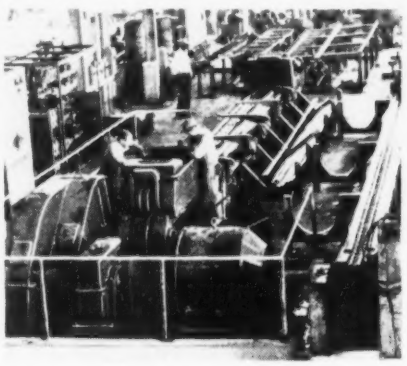
DRAWBENCH:

Sierra Drawn Steel Corp. adds to facilities in expansion move.

An unusual addition to Southern California's rapidly expanding heavy industry was the installation recently of the largest drawbench west of Chicago by Sierra Drawn Steel Corp., Los Angeles.

The drawbench was manufactured by McKay Machine Co. of Youngstown, Ohio. The machine handles carbon and alloy steel in all grades including heat treated stock, produces round, hexagon and all other shapes. The McKay drawbench is the only one of its type on the west coast able to pull the 4½ in. rounds most often used in making large shafting, sprockets, discs, die blanks and similar products.

Power—Sierra's new drawbench, with a 100,000 lb pull capacity, draws a bar of 4½ in. singly, or two bars at a time 2½ in. in diam, or three 1¼ in. diam bars at a time, or comparable squares, flats, or hexagons. A hydraulic push head exerting a pressure of 2500 to 3000 psi feeds bar stock to the die.



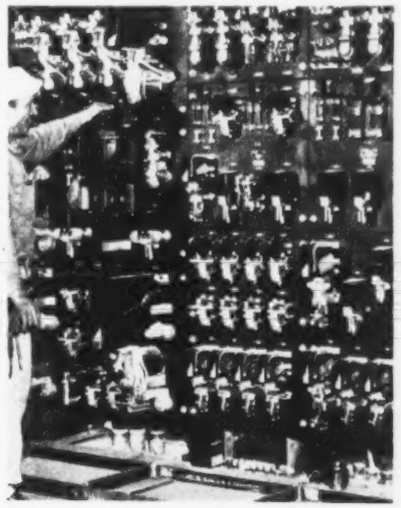
DRAWBENCH with 100,000 lb pull capacity recently installed at Los Angeles plant will draw bars up to 4½ in.

After penetrating the die 6 to 8 in., grippers grasp the extruded stock and continue the pull to complete the shape. The draw carriage reaches a speed of 100 fpm in 4 ft or less of travel after grasping the stock as it comes from the die. Drawn stock emerges at rates of 60 to 100 fpm.

Some Dimensions—Weight of the installation is almost 50 tons.

Length of the drawbench itself is 54 ft and width is 16 ft. Feed racks 30 ft long make an overall length of 84 ft. More than 93 tons of concrete were used in pouring the foundations for the bench.

Several automatic operations add to the speed and versatility of Sierra's new drawbench. They include an automatic return of the carriage to the die and automatic hydraulic arms to throw off the shape after it is drawn.



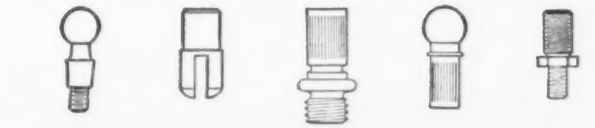
RECTIFYING EQUIPMENT and control panel for Sierra Drawn Steel Corp.'s new drawbench, largest in the West.

Grip Next Bar — When stock completes its run through the die and the carriage is returned for another piece of bar stock, gripping devices on the carriage automatically grasp the next bar to be fed through.

Feed benches are inclined 1 in. from horizontal to drop stock onto the feed carriage by gravity. After completion of its travel through the die, automatic throw-off arms place the drawn shape onto a storage rack where it is transported by crane to the straightening and polishing machines.

Pushpointer — The machine is equipped with an integral and automatic pushpointer which has a push capacity corresponding to 230,000 lbs. This enables the bars to be pushed through the die, eliminating the necessity of prepointing before the draw.

Turn Page



Automatic Screw Machine Products

in steel, brass, or other metals . . . from 1/16" to 2¼" diameter are simple production runs at Blake & Johnson. Slotting, cross-drilling, burring, broaching, slabbing, roll-threading and drilling—are every-day operations. Our engineering and manufacturing know-how is at your service whether you need custom-built machine parts or slotted as well as Phillips head machine screws, tapping screws, stove bolts, Twin-Fast® wood screws, special headed products, machine screw nuts, rivets, chaplets, wire forms.

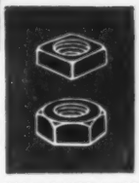
Write for new catalog.

TAPPING SCREW

TWIN-FAST SCREW

STOVE BOLT

MACHINE SCREW



MACHINE SCREW NUTS

SPECIAL WIRE FORM

fastenings

BLAKE & JOHNSON

SINCE 1849

WATERVILLE 48, CONNECTICUT

Shellcast®

Production casting of stainless steel by the shell mold process is now a reality at COOPER ALLOY. To get the jump on competition, bring your cast stainless problems to the world's leader. No obligation of course.

THE COOPER ALLOY FOUNDRY CO. HILLSIDE, NEW JERSEY

LEADING PRODUCERS OF **STAINLESS STEEL** VALVES FITTINGS AND CASTINGS

—Technical Briefs—

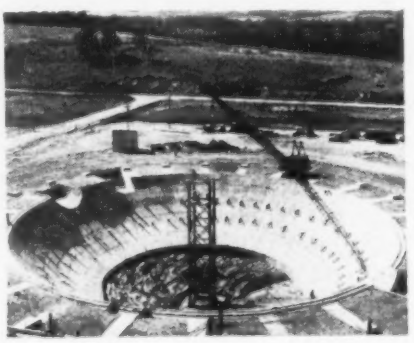
FOUNDATION:

Atomic submarine models will be tested in big sphere.

The saucer-shape foundation for the 225-ft steel sphere that is to house a nuclear submarine power plant being built by the Atomic Energy Commission for the U. S. Navy has been completed. Work on assembling the hull of the land-based prototype submarine is now underway.

Known as the Submarine Intermediate Reactor, this project is under the direction of the Knolls Atomic Power Laboratory and the General Electric Co. The reactor, and the sphere enclosing it, are being built on a 4000 acre site at West Milton, N. Y., about 18 miles north of Schenectady.

Protection—Spherical design of the reactor building was adopted to give additional protection to



CONCRETE SAUCER 179 ft in diam and 42 ft deep will be the foundation for a 225-ft steel sphere. Sphere, largest ever constructed, will house atomic power plant. Plant will be operated by GE for the Atomic Energy Commission.

operating personnel and to off-site areas during test operations beyond the many safety controls of the reactor itself.

Similar structures are widely used in the chemical and petroleum industries, but the West Milton sphere will be the largest ever constructed. In the remote event that simultaneously all other controls failed, the resulting release of radioactive material would be contained in the sphere which will have a net "free" space of more than 5.4 million cu ft.

Rests On Saucer—Outer periphery of the building will be 706 ft.

The sphere will rest on the concrete saucer which is 179 ft in diam and 42 ft deep. A ring of steel columns set on concrete outside the structure and reaching to the middle of the sphere will give further support to the building.

Welded steel plates will make up the skin of the ball. Plates will be hoisted into position by a derrick mounted on top of a temporary central steel tower. The derrick, now in place, reaches up 424 ft above ground.

Close Inspection—Every weld in the structure must be X-rayed to assure that there are no leaks. To do this on the bottom, a 4-ft space is provided temporarily between the base of the sphere and the concrete saucer.

Inside, the concrete floor on which the reactor will rest will be slightly above ground level and the well of the saucer beneath the floor will be filled with compacted mixture of aggregate and earth. The reactor building will be air conditioned.

Hull on Skids—As soon as the columns are in place, the first ring of plates will gird the sphere at its center and assembly will proceed both upwards and downwards.

The hull of the submarine will be assembled just outside the building and when the latter is completed and tested, the hull will be skidded into the huge ball through a special wall section and the sphere again sealed.

Turn Page

HAVE YOU TRIED
THIS
ACID-DETERGENT METHOD
FOR REMOVING
RUST AND OIL
AT THE SAME TIME?

Metal craftsmen using Oakite Compound No. 33 say it is just what they've been looking for: a metal-cleaner that combines three important operations into one:

1. **It removes rust** *at the same time that*
2. **It removes oil** *at the same time that*
3. **It prepares the metal for painting**

Oakite Compound No. 33 removes rust, heat scale, tarnish, other oxides, stamping and forming oils, rust preventives, carbon smuts, soldering and welding fluxes, identification inks and similar soils. It develops excellent paint adhesion on steel, cast iron, aluminum sheet and castings.

For Use in Tanks or by Hand—Oakite Compound No. 33 is great for soak-cleaning metal parts of moderate size; and great for hand-swabbing on large metal surfaces.

Often Avoids Pickling—Oakite Compound No. 33 removes rust and oil so successfully that it frequently eliminates the need for a cycle of separate cleaning, pickling, neutralizing and paint-conditioning operations. It saves money in many ways.

FREE For a copy of "*New metal cleaner removes oil and rust in one operation*", write to Oakite Products, Inc., 30H Rector St., New York 6, N. Y.

Users Are Saying Good Things About Oakite Compound No. 33

PENNSYLVANIA: "Well pleased with removal of drawing compound, heat scale, rust and oil. Parts coming through good and clean."

CALIFORNIA: "This material is a beauty . . . one we've been waiting for on this jeep overhaul job."

MICHIGAN: "Removes oil, rust and scale faster . . . Increases adherence of rubber to steel for motor mounts and bumpers."

MICHIGAN: "Removing rust for less than 9 cents per wheel; sand blasting cost 25 cents."

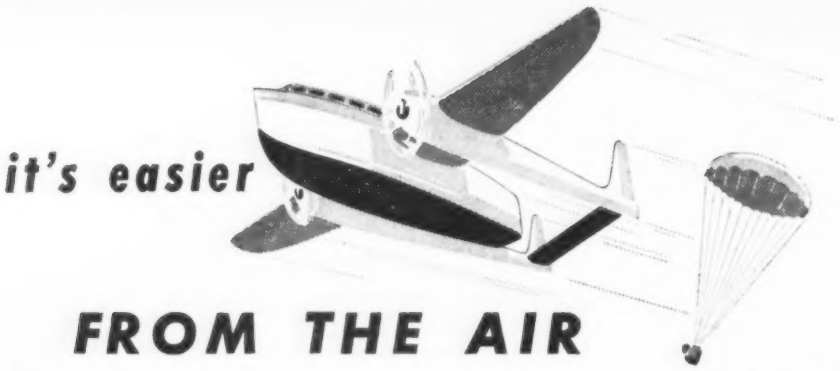
TEXAS: "Eliminates practically all rejects and also handwiping of booster caps."

NEW YORK: "Have never seen such clean parts with such perfect paint adhesion . . . Putting Oakite Compound No. 33 in specification sheets for sub-contractors on these registers."

ILLINOIS: "Works a miracle taking heavy rust off steel cabinets."

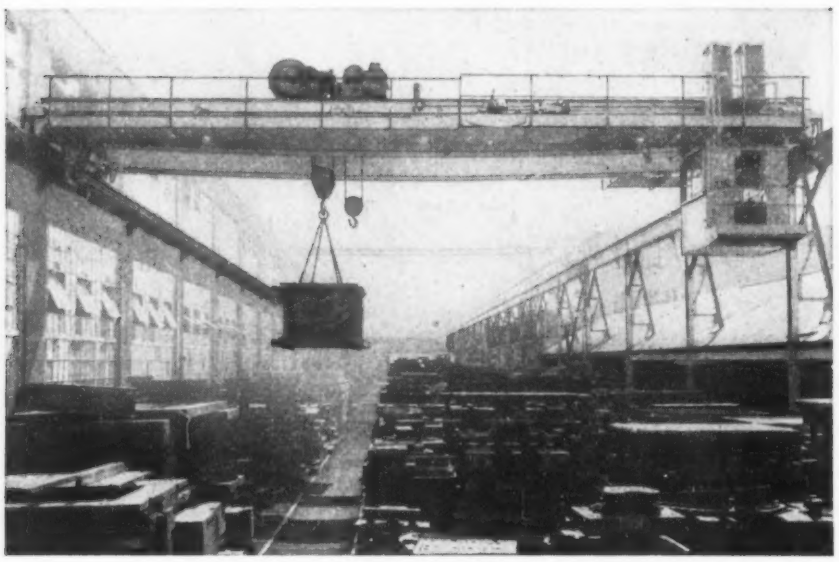
SPECIALIZED INDUSTRIAL CLEANING
OAKITE
MATERIALS · METHODS · SERVICE

Technical Service Representatives Located in Principal Cities of U. S. & Canada



it's easier

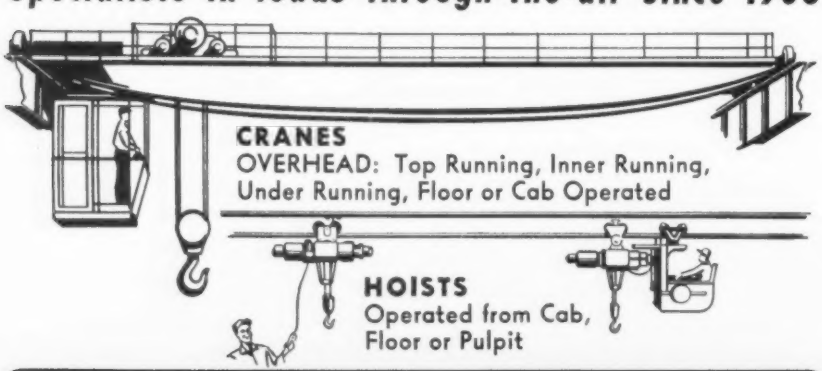
FROM THE AIR



● Want to spot loads more accurately — stack them higher? Then put this Shepard Niles Crane to work! From his vantage point, the operator can see where loads should go, then deliver them there directly.

● Little wonder so many plants use through-the-air handling — it's so fast, so easy, so economical. But which crane is best for your plant? The Shepard Niles representative is qualified to answer this question because he specializes in through-the-air handling. He knows the importance of installing the right equipment from the start. Write for Bulletin 180 today — and ask to have a representative stop by your office.

Specialists in loads through-the-air since 1903


CRANES
OVERHEAD: Top Running, Inner Running, Under Running, Floor or Cab Operated
HOISTS
Operated from Cab, Floor or Pulpit

SHEPARD NILES
CRANE AND HOIST CORPORATION

1418 SCHUYLER AVENUE • MONTOUR FALLS, N. Y.

—Technical Briefs—

CRUCIBLE GRAPHITE:

Domestic graphites for foundry crucibles equal foreign grades.

Domestic graphites from Alabama and Pennsylvania are fully as good as the imported Madagascar graphite for making nonferrous foundry crucibles, a recent study by the National Bureau of Standards has found.

NBS also found that small-flake graphite can be used instead of the generally preferred large-flake graphite without impairing the service life of "carbon-bonded" graphite crucibles.

Studies indicate the carbon-bonded type of crucible has about twice the average service life of the clay-bonded type.

Widely Used — Graphite crucibles are used by several hundred U. S. nonferrous metal foundries. These crucibles are made from graphite flakes, bonded either with clay or with organic binders such as tar or pitch.

Graphite is similarly used in the manufacture of ladle stopper heads required by the steel industry. Until now, large-flake graphite imported from Madagascar has been used for these purposes almost to the exclusion of other graphites.

Stockpiled—Because of the strategic importance of crucible graphites, now being stockpiled, the Army-Navy Munitions Board suggested that the national Bureau of Standards undertake the present study. As a result of the NBS findings, a Pennsylvania graphite mine is being reactivated so as to insure the availability of domestic graphite if the supply of lower-cost Madagascar graphite should be cut off.

The American Crucible Co. and the National Crucible Co. cooperated with the Bureau in manufacturing the crucibles used for the study. Graphites from the three sources—Madagascar, Alabama, and Pennsylvania — were furnished by the Bureau to the manufacturers in various combinations of flake sizes.

Service Tested — Six foundries cooperated in service-testing the crucibles. The selection of foundries was limited to those melting brass and having enough furnaces in operation to insure rapid progress of the tests. Each foundry received crucibles of sizes to which it was accustomed.

Service life of the crucibles made from the Alabama and Pennsylvania graphites averaged fully as good as that of crucibles made from Madagascar graphite. Carbon-bonded crucibles in general gave about twice as many heats as did clay-bonded crucibles.

Foundries cooperating in the tests included: Ampco Metal, Inc., Milwaukee; Chicago Faucet Co., Chicago; Chicago Hardware Foundry Co., North Chicago, Ill.; General Electric Co., Philadelphia; Johnson Bronze Co., New Castle, Pa.; Sloan Valve Co., Chicago.

Powder Parts Cut Clock Costs

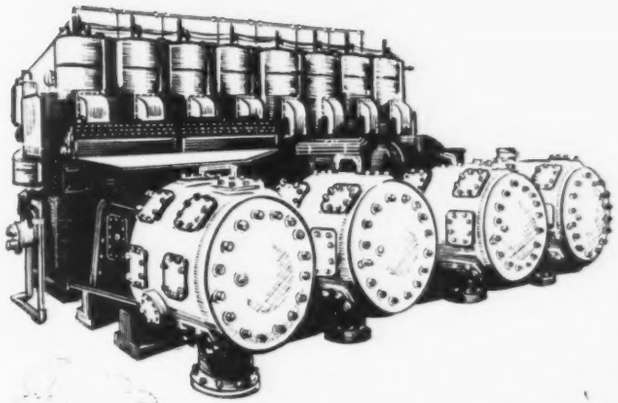
Small clock parts, such as gears, are being made by Lux Mfg. Co., Waterbury, Conn., on a battery of Stokes R-4 powder metal presses at savings as high as 50 pct compared with previous manufacturing methods, it is reported. Complex design of the clock parts prohibits economical production by machining, casting or stamping.

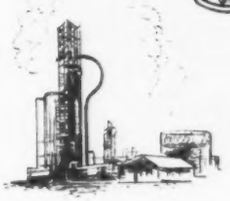
One clock piece, an alarm-actuating mechanism, has 11 radii, two through-holes, and two or three different levels. Formerly machined in several operations, two of them requiring assembly, this part is now made of iron powder.

Turn Page

"File those blueprints under C, not under me."

For DEPENDABILITY
IN
REFINERY EQUIPMENT





The Correct Fastener for the Job

These Erie bolts have at least one thing in common—they are designed to hold against maximum strains imposed by pressure, temperature, or corrosion. They differ in material, shape and threading as the job directs. For 38 years, we have geared our plant to manufacture these unusual high quality bolts to exacting specifications.

This broad experience backed by a high desire to be of service to you is your assurance that Erie is ready to meet your special bolting requirements.

Barium

ERIE BOLT and NUT CO.
ERIE • PENNSYLVANIA

STUDS • BOLTS • NUTS
ALLOYS • STAINLESS
CARBON • BRONZE

Representatives in Principal Cities.

SAVES YOU DAYS

WHEN YOU WANT

TOOLS FAST

When you need hand and bench tools *now*, delivery next month won't help much! To give you service *now*—as well as to help you with your year-around tool problems—Snap-on's 42 factory branch warehouses listed here put a selection of more than 4,000 tools at your elbow. The Snap-on branch near you is staffed with tool specialists—men who know how to help you save production and maintenance time and increase safety by using the right tools. Let us send you copies of the latest Snap-on Industrial and General Catalogs.

SNAP-ON SERVES INDUSTRY EVERYWHERE THROUGH THESE 42 FACTORY BRANCH WAREHOUSES

Albany 5, N. Y., 546 Clinton Ave.
Atlanta, Ga., 380 Techwood Drive, N.W.
Baltimore 18, Md., 1209 E. 25th St.
Boston 35, Mass., 116 N. Beacon St.
Brooklyn 25, N. Y., 1649 Bedford Ave.
Buffalo 13, N. Y., 628 W. Utica St.
Charlotte 6, N. C., 915 S. Clarkson St.
Chicago 7, Ill., 190 N. May
Cincinnati 6, Ohio, 605 E. McMillan St.
Cleveland 15, Ohio, 2912 Euclid Ave.
Dallas 1, Texas, 2932 Commerce St.
Denver 3, Colo., 1050 Broadway
Detroit 2, Mich., 93 Piquette Ave.
Fargo, N. Dak., 421 N. P. Ave.
Houston 3, Texas, 1810 LaBranch St.
Indianapolis 2, Ind., 848 Fort Wayne Ave.
Jacksonville 6, Fla., 1602 Walnut St.
Kansas City 2, Mo., 3635 Main St.
Los Angeles 14, Calif., 1717 W. 6th St.
Milwaukee 3, Wis., 2600 W. State St.
Minneapolis 3, Minn., 1218 Harmon Place
Newark 6, N. J., 823 Sandford Ave.
New Orleans 13, La., 1040 Camp St.
New York 67, N.Y., 2807 White Plains Rd.
Oklahoma City 3, Okla., 901 N. Hudson
Omaha 2, Nebr., 109 S. 24th St.
Philadelphia 30, Pa., 1710 Fairmount Ave.
Pittsburgh 8, Pa., 7007 Kelly St.
Richmond 20, Va., 1617 West Broad St.
San Francisco 2, Calif., 635 Golden Gate
Seattle 22, Wash., 1501 Olive Way
St. Louis 3, Mo., 2647 Washington Blvd.
Syracuse 3, N. Y., 323 Irving Ave.
Toledo 6, Ohio, 2932 Monroe St.

IN CANADA

Edmonton, Alberta, 10232 103rd St.
London, Ontario, 111 Mt. Pleasant Ave.
Moncton, N. B., 27 Pearl St.
Montreal 15, Que., 751 Jean Talon St. W.
Regina, Sask., 2070 Albert St.
Toronto 17, Ont., 130 Laird Drive
Vancouver, B. C., 1043 Davie St.
Winnipeg, Manitoba, 238 Garry St.

SNAP-ON TOOLS CORPORATION
8132-K 28th Ave., Kenosha, Wis.

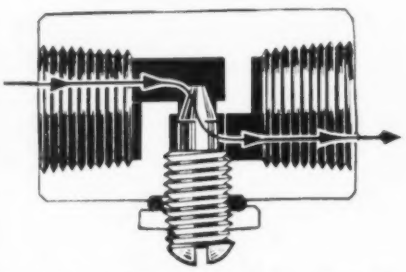
—Technical Briefs—

CONTROL VALVES:

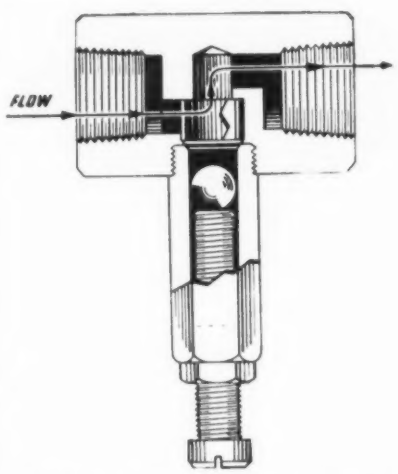
Close control of air and hydraulic line flow with vernier valve.

Continued application of air and hydraulic systems to aircraft, automotive and other metalworking applications has placed emphasis on the need for more accurate control of flow.

Two valves recently designed by Pneu-Trol Devices, Inc., permit a wide range of accurate flow control. The valves are machined from hexagonal bar stock.



VERNIER THREAD on needle valve with tapered stainless steel needle, permits close adjustments necessary with many air and hydraulic lines.



VELOCITY LIMITING valve, holds top limits of flow velocity and volume. Stainless steel ball is pulled against seat and held in closed position by line pressure when flow exceeds setting.

Vernier—The needle valve gives vernier control of flow through a wide range in either direction. It is recommended for gas, air or liquid to flow upward to save wear on the **gasket.**

On the velocity limiting valve, the adjust screw raises or lowers the pressure setting at which the valve closes.

ROBOT ELEVATORS:

Passengers run bank of elevators with aid of electronics.

Four robot elevators directed by an electronic "traffic cop" will carry the 1000 employees and visitors in the headquarters building of the Bonneville Power Administration now being built at Portland, Oregon.

The elevators will require no operators yet will match elevator service to demand during the morning, noon and evening rush as well as during normal periods and after regular working hours, Westinghouse Electric Corp. reports.

Zoned — An electronic system called "Selectomatic Automatic" performs the flexible feat. The elevator starter can set a switch each morning, noon and evening dividing the 8-floor office building into a high zone and a low zone. Certain cars are designated to serve each zone.

Loaded cars automatically bypass corridor calls on the upward or downward trips during rush hours, making all four cars "expresses" for fastest possible filling and emptying of the building. Passengers press buttons inside the elevator to select their floors. Should a car empty on the upward trip before it reaches its top terminal, it immediately returns to the first floor for reloading.

Rush Hour—Under the system, cars on rush hour duty leave at regular intervals whether loaded or not. On the other hand, if they are 80 pct loaded, they leave at once. Doors are closed automatically but stop and reopen unless all passengers are clear of them.

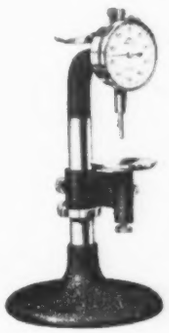
Turn Page

"Well! Will I have fun in here!"

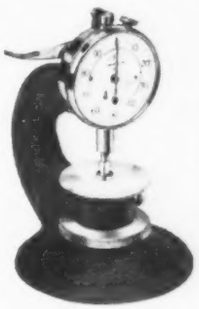
FOR *Strictly* IMPERSONAL INSPECTION CHOOSE AMES DIAL COMPARATORS

Ames Dial Comparators make the inspection of duplicate parts an extremely simple, rapid and accurate operation. Ames Comparators are strictly impersonal in their accuracy — the results being in no way dependent on the skill or judgment of the operator. The pressure of the gauging members against the work is mechanically determined and therefore uniform.

Check the Ames Dial Comparators shown — one of them may solve a Quality Control problem for you.



Ames No. 1 Dial Comparator is an easily adjustable bench model that measures objects up to 2" in cross section. The table bracket may be quickly located and locked in position on the column. The table itself may be further positioned and locked for final fine adjustment. This comparator is designated *Ames No. 1W* when equipped with dead-weight contact pressure and contact area to ASTM specifications for measuring resilient materials, such as rubber, plastics, etc.



Ames No. 2 Dial Comparator is a compact, stable bench model for measuring non-yielding materials — sheet metal, glass, hard rubber. The 2" diameter table is adjustable to bring pointer to zero. *Ames No. 2W* is similar to the Ames No. 2, but is furnished with dead-weight contact pressure and contact areas to ASTM specifications for checking textiles, plastics, sheet rubber, etc.

Ames No. 13 Dial Comparator features flat-ground, cast-iron base of ample size for using V-blocks and locating fixtures for checking rounds, flats and odd shapes. Also, the No. 13 can be fitted with a fine adjustment for close setting. Accurately adjustable bracket holds any Ames Micrometer Dial Indicator.

Ames No. 130 Dial Comparator is designed especially for inspecting comparatively large parts. For this reason, the flat-ground steel base, the adjustable indicator support on which can be mounted any Ames Micrometer Dial Indicator, and the upright column are proportioned to suit the user's particular requirements.

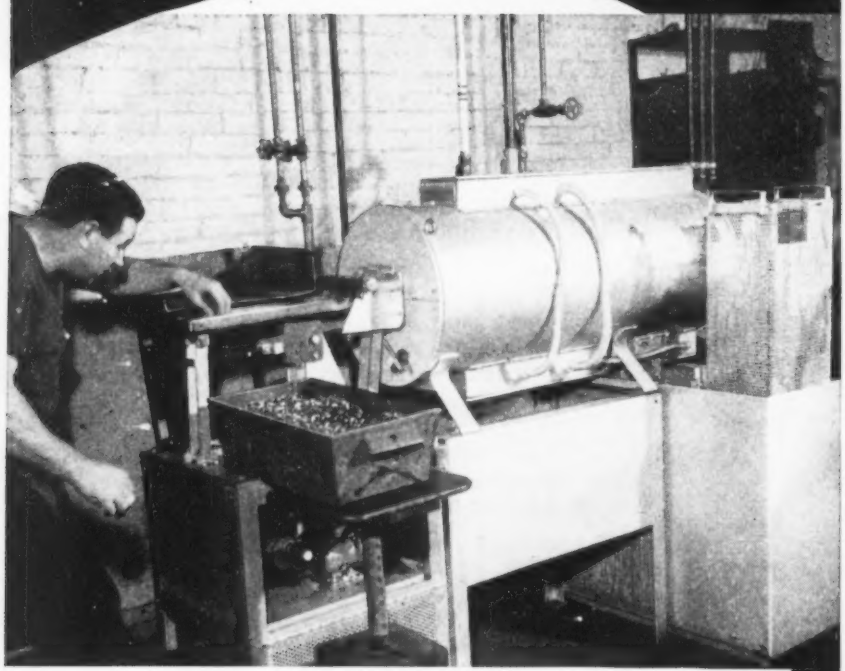
Send us your Quality Control job specifications, and we will supply complete details and proposal without obligation.

Representatives in principal cities. B. C. AMES CO. *25 Ames Street Waltham 54, Mass.*

Mfgr. of Micrometer Dial Gauges • Micrometer Dial Indicators

RAYMOND MFG. CO.

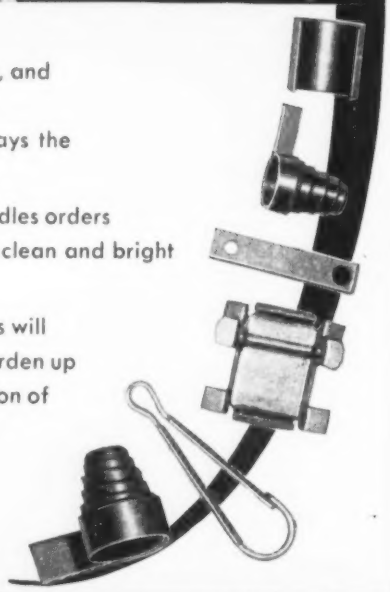
"Bright" Hardens Precision Springs in a HEVI DUTY Shaker Hearth FURNACE



"We bright harden carbon, vanadium, and stainless steel springs without distortion in our Hevi Duty Shaker Hearth furnace," says the Raymond Mfg. Co. of Corry, Pennsylvania.

"Our Hevi Duty Shaker Hearth furnace handles orders faster, and work comes out of the furnace clean and bright with no scale or decarburization."

Hevi Duty standard Shaker Hearth Furnaces will carburize, nitride, dry cyanide or bright harden up to 150 lbs. of small parts per hour. Operation of this production machine is semi-automatic. Write for bulletin HD-850 today.



HEVI DUTY®

HEVI DUTY ELECTRIC COMPANY

MILWAUKEE 1, WISCONSIN

Heat Treating Furnaces... Electric Exclusively

Dry Type Transformers *Constant Current Regulators*

TOUCHDOWN:

Navy's TRODI calculator gives prompt correction data.

An electrical-optical "brain" developed by North American Aviation to give instant data on how fast an airplane "hits the deck" or lands, has won its sea legs in operational tests aboard the Navy's aircraft carrier Midway.

In the past the rate of descent for an experimental airplane has been recorded by cameras, but the photographed data was not available for several days. TRODI, Touchdown Rate of Descent Indicator, flashes this information immediately at far less cost.

On Test — All new Navy airplanes must be tested for rate of descent before they are placed in regular operation. Formerly in carrier landings, with an experimental plane, a pilot would not know for some time if he had come in for a landing at the correct rate of descent.

With TRODI's rapid "brain," the data is ready for the pilot as soon as he steps from the cockpit. He can then correct his future landings if necessary.

TOUCHDOWN rate of descent indicator (TRODI) is housed in pedestal, left. Unit gives fast calculation on proper rate of descent for carrier landing of this North American XJF-2 Fury Jet. Calculation is based on plane's intersection of two beams of light.

A vital part of recent carrier suitability tests aboard the Midway for the North American FJ-2 Fury Jet and three other new Navy fighters, the new instrument recorded in a few landings results that would have required a number of days with the old camera method.

Accurate—The gadget measures rate of descent with an accuracy

of 0.4 fps and is in regular service with the U. S. Navy. The instrument also has applications to benefit other branches of the military services and civil aviation.

To seek rate of descent data, TRODI sends out two parallel beams of light, thin vertically and wide horizontally. They are 1 ft apart.

Cuts Beams—A mirror system on the incoming airplane cuts the top beam, reflecting the light back to a photoelectric cell, which starts an electrical charge into a condenser. The descending airplane then cuts the second and lower beam, reflects it, and stops the charge going into the condenser.

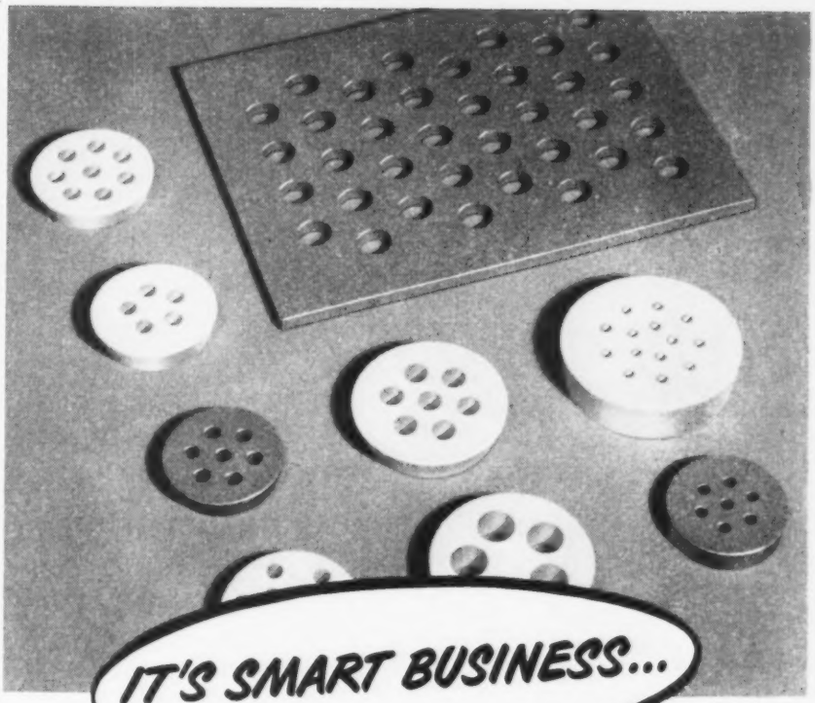
The electrical charge stored during the interval between beams is quickly translated from voltage to rate of descent in fps.

Develop Improved Paint Method

Baked enamel and lacquer finishing of small metal parts from one-half inch to two feet in length, formerly possible only by the spraying method, may now be economically coated by an entirely new dipping process. Many difficulties formerly encountered in the dipping process have been eliminated.

Known as the Steingetz System, and developed by Apex Stamping Co., Newark, N. J., the method grew out of the high cost of painting enamel metal parts for drapery hardware. It uses a hydraulic means of controlling the capillary action in the painting process.

Turn Page



IT'S SMART BUSINESS...

TO USE

ALSIMAG® Ceramic STRAINER CORES

- Strong, will not break in handling
- Non-spalling
- Easy and fast to handle
- Not affected by moisture
- Flat and uniform
- Completely free of gas
- Resist heat shock
- No erosion at normal pouring temperatures
- Do not contaminate scrap

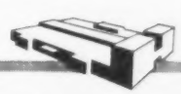
Maybe you think you are making your own sand-oil strainer cores cheaper than you can buy AlSiMag Ceramic Strainer Cores — BUT CAN YOU?

By the time you figure costs of sand, binder, oil, LABOR in mixing and core rooms, core oven costs and OVERHEAD you may find that *AlSiMag Cores are actually lower in cost.*

Most "Home Made" cores have comparatively little strength. They have to be handled slowly and with care. Even then a lot of them are wasted because they break. Holes may not be accurate or the core may break down in pouring. Then you've got nothing to show for all your trouble and expense.

AlSiMag cores are tough and fast to handle. They are flat, accurate and uniform. They are completely free of gas. They resist heat shock. They do the job, give you cleaner, smoother castings and LESS REJECTS.

SEE FOR YOURSELF—ask for free samples of sizes in stock; test them under the toughest conditions in your foundry. You'll see that AlSiMag Ceramic Strainer Cores pay for themselves many times over.



OUR NEW MODERN PLANT AND HIGH SPEED PRODUCTION FACILITIES PERMIT NEW LOWER PRICES AND DELIVERY IN ANY QUANTITY.

AMERICAN LAVA CORPORATION

CHATTANOOGA 5, TENNESSEE

51ST YEAR OF CERAMIC LEADERSHIP

it's down to
BRASS TACKS

KENNAMETAL "IN-PLANT" TRAINING *program on carbide tooling*

No frills or fuss in the Kennametal "In-Plant" Training Program. We show your men how to select the right carbide tool for the job, use it properly, and resharpen it correctly; as well as how to simplify tool stocks and smooth out kinks in operating routines.

This program is practical — not academic; not theoretical. In your own plant it applies the on-the-job "know-how" of our field organization — and this experience is greater than that of any other carbide tool manufacturer.

The objective of Kennametal's "brass-tacks" program is to help you get top performance from a tool material that's *made* to give you more production in less time, at less cost. Ask our nearest field engineer for the facts. Kennametal Inc., Latrobe, Pa.

KENNAMETAL
CEMENTED CARBIDE TOOLING
THAT INCREASES PRODUCTIVITY

—Technical Briefs—

AIR LINES:

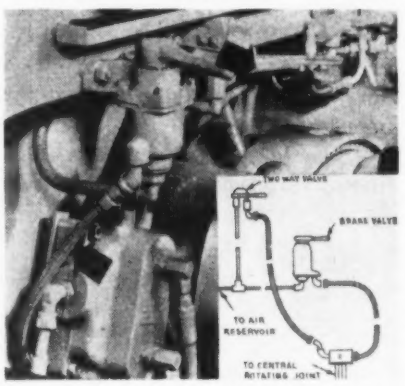
Flexible metal hose absorbs vibration, cuts maintenance.

Maintenance connected with operation of compressed air lines for air-brake and air-operated transmission control lines often poses a headache in operation of heavy equipment.

Engineers of Unit Crane & Shovel Corp., Milwaukee, working with designers at Titeflex, Inc., Newark, N. J., recently found a solution for this problem in application of flexible metal hose.

Involved Piping — Piping compressed air from a reservoir tank, through two-way brake and transmission control valves, and a vertical propel shaft, to a central rotating joint proved a problem.

From the central rotating joint rigid pressure lines carry compressed air impulses to front and rear axle brake pistons and to the two-speed air-operated transmission.



VIBRATION AND CORROSION PROOF installation of flexible metal hose on Unit mobile crane helped eliminate trouble spots.

Extremes—Maintenance on these vital pressure lines hinges on preventing air escape which might cause loss of braking power or transmission control. Due to constant vibration and rough handling of the air lines and valves in service, extremes of stress and wear are routine.

Extensive in-field tests of flexible metal hose on air control lines were established.

Tests indicated convoluted sec-

tions of flexible metal hose with round wire braid reinforcing cover withstood constant vibration on the Unit Crane during operation.

No Wear—No signs of fatigue stressing or metal wear due to vibration were found no matter how long the metal hose remained in operation. In addition, the flexible metal hose acted as a vibration absorber to eliminate strain and wear around couplings.

A second reinforcing layer of flat-ribbon wire braid around the outside of the air line tubing added considerable resistance to internal pressure and external damaging from accidental mishandling and the corrosive action of spilled lubricants, acids. Disassembly of air lines for maintenance inspection was found to be unnecessary.

METALLURGY:

NBS studies solubility of carbon in austenitic stainless.

Austenitic stainless steels, characterized by a distinctive crystal structure, combine superior resistance to corrosion with ease of working. Properties and applications of these steels are considerably affected by the amount and form of carbon they contain.

Because of the importance of such knowledge, the National Bureau of Standards recently made a study of the solubility of carbon in austenitic stainless steel

Turn Page

"We want to get married."

Niagara's HYGROL DRIES AIR BEST

with exact moisture content

- ▶ to control your product's quality
- ▶ to prevent condensation on your product or material
- ▶ to prevent changes due to moist air in contact with your product
- ▶ to protect your material from dampness
- ▶ to protect your processing of moisture-sensitive material
- ▶ to DRY your material or product
- ▶ to pack or store your product safe from moisture damage
- ▶ to get exact moisture control for the precise atmosphere condition you need
- ▶ to provide precise atmospheric conditions for testing
- ▶ to increase your air conditioning capacity
- ▶ to DRY large quantities of fresh air from outdoors

The Niagara's Controlled Humidity Method using HYGROL moisture-absorbent liquid is

easy and most effective because . . . it removes moisture as a separate function from cooling or heating and so gives a precise result constantly and always. Niagara machines using liquid contact means of drying air have given over 20 years of service.

Most reliable because . . . the absorbent is continuously reconcentrated automatically. No moisture-sensitive instruments are required to control your conditions.

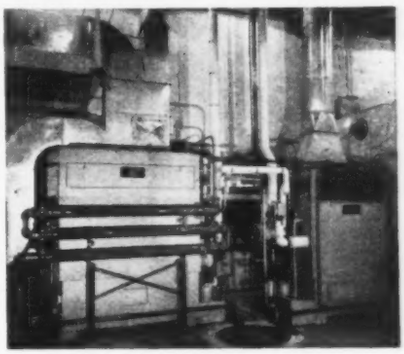
Most flexible because . . . you can obtain any condition at will and hold it as long as you wish in either continuous production, testing or storage.

Easiest to take care of because . . . the apparatus is simple, parts are accessible, controls are trustworthy.

Most compact, taking less space for installation.

Inexpensive to operate because . . . no re-heat is needed to obtain the relative humidity you wish in normal temperature ranges and frequently no refrigeration is used to remove moisture.

The cleanest because . . . no solids, salts or solutions of solids are used and there are no corrosive or reactive substances.



Niagara Controlled Humidity Air Conditioning

This method removes moisture from air by contact with a liquid in a small spray chamber. The liquid spray contact temperature and the absorbent concentration, factors that are easily and positively controlled, determine exactly the amount of moisture remaining in the leaving air. Heating or cooling is done as a separate function.

For complete information write

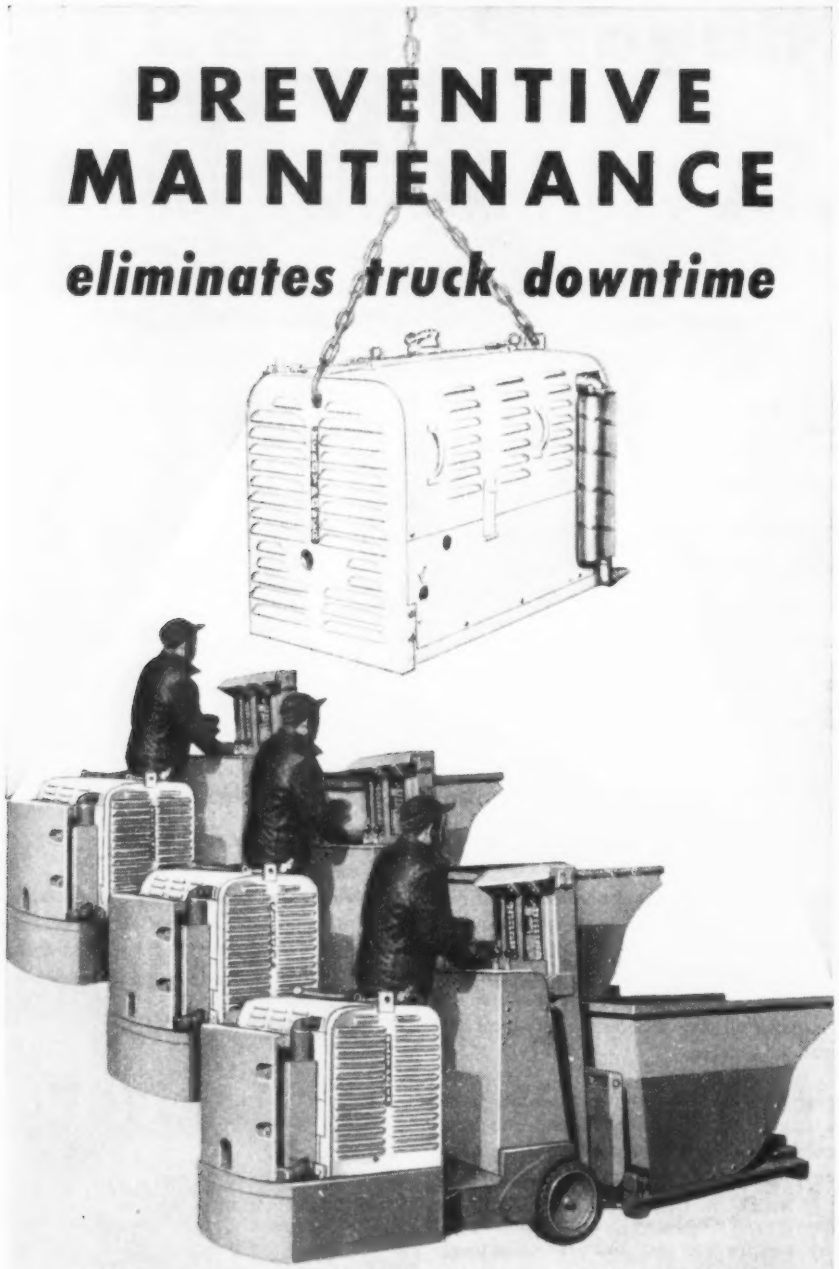
NIAGARA BLOWER COMPANY

Dept. IA, 405 Lexington Ave., New York 17, N. Y.

District Engineers in Principal Cities of United States and Canada

PREVENTIVE MAINTENANCE

eliminates truck downtime



READY-POWER IS *BEST* FOR PREVENTIVE MAINTENANCE

Tie up a truck because of power failure? Never! Equip your fleet with *interchangeable* Ready-Power gas-electric units and, then, have one extra for the shop. Thus, power units can be rotated for preventive maintenance . . . and your trucks stay *on the job* . . . where they belong.

Remember...Your Truck Is No Better Than Its Power!

CONTINUOUS-DUTY POWER UNITS

The READY-POWER Co.

3822 Grand River Ave., Detroit 8, Michigan

Manufacturers of Gas and Diesel Engine-Driven Generators and Air Conditioning Units; Gas and Diesel-Electric Power Units for Industrial Trucks

containing 18 pct chromium and 10 pct nickel.

Substantially Complete—Bureau investigators found that with a carbon content of 0.007 pct the lowest content studied, solution was substantially complete between 1300° and 1400°F, it was found.

Solubility appeared to increase approximately linearly from about 1400° to 1975°F, the maximum temperature studied, where carbon solubility was approximately 0.08 pct. These values of solubility are appreciably lower than those previously reported.

304 ELC—The solubility curve developed at NBS indicates that type 304 ELC (extra low carbon) stainless steel can be effectively annealed at 1700°F, but that ordinary type 304 stainless should be annealed at temperatures in excess of 1900°F if the carbon is to be fully dissolved.

The NBS study also points up limitations on the effectiveness of attempts to eliminate intergranular embrittlement of austenitic 18 pct Cr-10 pct Ni steel by reducing carbon content.

Specimens investigated at NBS were high-purity iron-nickel-chromium alloys containing various additions of carbon ranging from 0.007 to 0.30 pct. All alloys were melted and solidified in vacuum. Ingots thus formed, weighing about 2 lb each, were hot-forged to about 0.6-in. diam, annealed at 1975°F, and cleaned by grinding to about 0.5-in diam. Half of each rod was then cold drawn.

Held 6 Weeks—Resulting specimens, both as annealed and as cold drawn, were next held at 800°F for 6 weeks to precipitate carbon in excesss of the solubility at that temperature. Finally, samples were held at various higher temperatures to effect resolution of the precipitated carbides up to the limit of solid solubility. The excess carbon not in solid solution was present as chromium carbide.

FLAME HARDENING:

Lathe ways to 30 ft long rapidly hardened, quenched in new setup.

Design and construction of a new machine for the flame hardening of lathe bed ways has been completed by the Monarch Machine Tool Co., Sidney, O. This oxy-acetylene machine replaces an earlier Monarch design of smaller capacity and somewhat different design and operation.

The original Monarch flame hardening machine was limited to bed lengths of 13 ft or less. Torches were moved the length of the bed which was held stationary and partially immersed in a tank of water which served for quenching. By contrast, the new machine accommodates bed lengths up to 30 ft, has the bed move beneath torches, which are held stationary and uses a water-jet system of quenching.

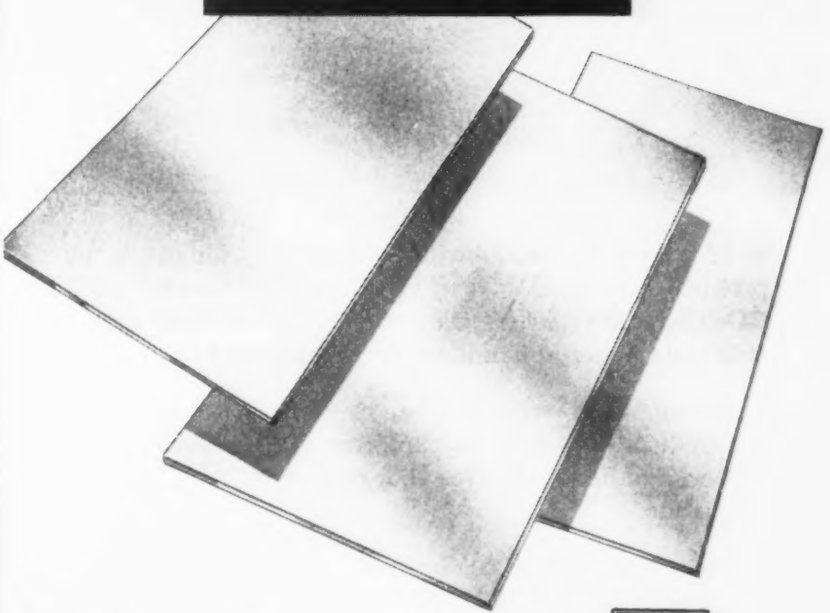
Heating Time Short—Lathe beds are made of high-strength alloy cast iron. This material has good characteristics when flame-hardened. Because of the speed of flame hardening the surface heating time is short. There is a gradual blend of the martensitic hardened layer into the tough under body of fine pearlitic iron.

Turn Page

"Before she squawks yuh better check the air pressure on her machine again, Harry."

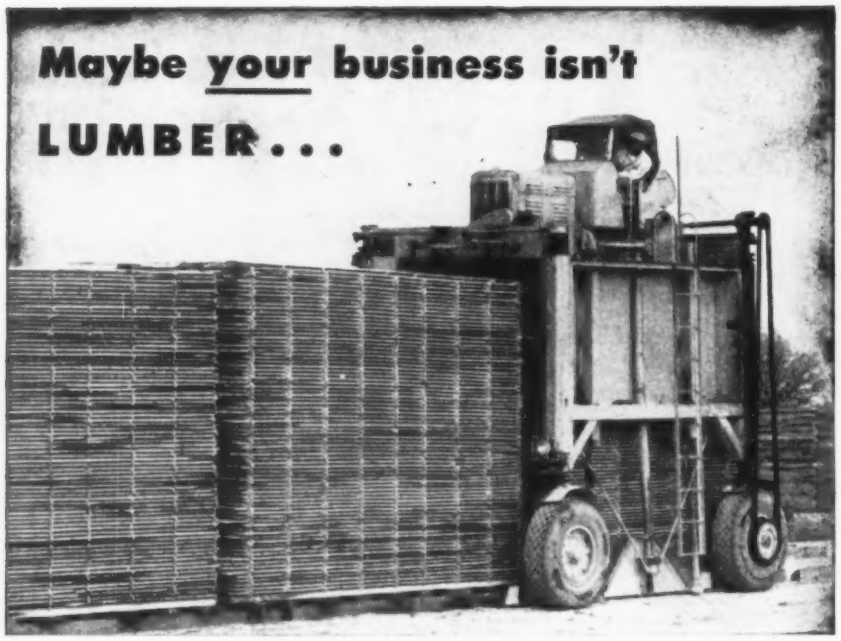
Ingersoll
specializes in . . .

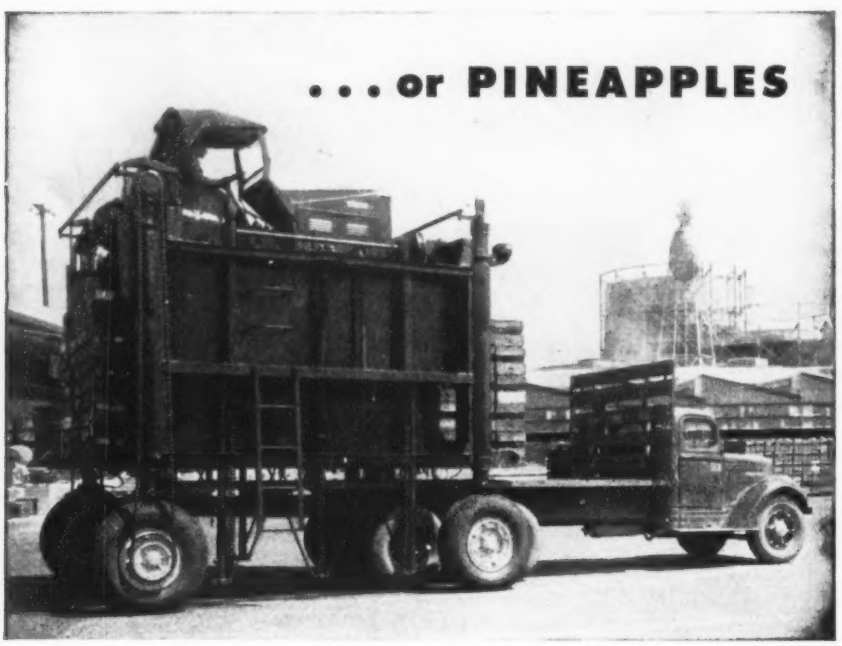
Heat-Resisting
STEELS



Ingersoll STEEL DIVISION
BORG-WARNER CORPORATION
310 South Michigan Avenue, Chicago 4, Illinois
Plant: New Castle, Indiana

ENGINEERING B-W PRODUCTION





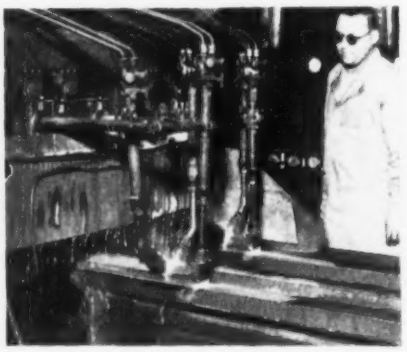
BUT... just imagine the savings you could make, the problems you could solve by handling your materials with ROSS Straddle Carriers, the most flexible and most adaptable mass material handling method known!

ROSS engineers will be glad to work with your materials handling men in exploring the possibilities of ROSS Straddle Carriers for your operations . . . there's no obligation.

Send for details on ROSS Straddle Carriers . . . 10,000 lb., 20,000 lb., 35,000 and 45,000 lb. capacities.

Rely On ROSS

THE ROSS CARRIER COMPANY
Direct Factory Branches and Distributors throughout the world.
425 Miller St., Benton Harbor, Michigan, USA



FLAME-QUENCH set up for hardening lathe bed ways handles lathes with bed lengths to 30 ft. Lathe moves, while flame and quench are stationary.

Way surfaces require only a finish grinding operation. Way sections have high wear resistance, but remain an integral part of the bed casting.

Regulated—On the new flame-hardening machine, flat and V surfaces are hardened simultaneously through the use of a 6-torch station. The heating effect of each torch must be carefully regulated since the bed speed is the same for all parts of the ways. The heating effect is controlled by varying the intensity of the flame, its distance from the surface being heated, or both.

Torch design is simple, comprising a flame zone followed by a water jet in the same unit. The water not only cools the torch tips, but also quenches the heated piece to produce the desired hardness. A Shore Scleroscope shows an average rating of 70 to 80 for hardened lathe bed ways. The average depth of the hardened section is ⅛ inch.

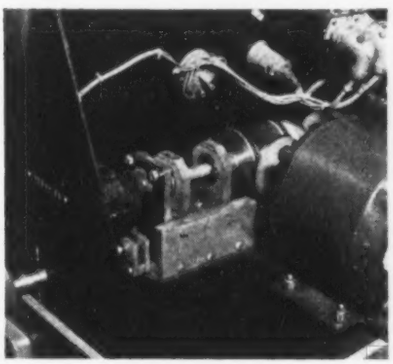
"I never thought it would come up, but what's the term for a trillion trillion?"

TESTING:

Synchroscopes quickly tested by disc transmission system.

A disc transmission system allows testing of synchroscopes in a matter of minutes in the instrument shop of TEMCO Aircraft Corp.'s Greenville, Texas, Div. Cycle overhaul of U.S.A.F. C-54's at this point has prompted development of numerous specialized test panels for quantity production.

Testing synchroscopes on the flight line with a tachometer and a C-1 tester was not only less accurate, but placed the test at a station where discrepancies could



SYNCHROSCOPES are easily tested with disc transmission system developed at TEMCO.

delay delivery. Asst. Foreman A. J. Chandler developed a test panel which gives a positive test in a fraction of the time previously required and placed the operation in the shop.

Small Motor—Powered with a 1/6 hp electric motor, a disc transmits power to two friction gears. One gear runs a generator at fixed speed, corresponding to the master tachometer generator in the aircraft. The other gear runs a second generator at varying speeds as the operator changes the position of the friction gear on the disc transmission.

A selector switch connecting the variable-speed generator with the synchroscope allows the operator to take dial readings for engine 2, 3 or 4, all of which register in relation to the master tachometer generator but have no relation with one another in synchroscope readings.

Turn Page

6 major improvements in Edmont gloves

to fit your job requirements

New flexible NEOX (reinforced neoprene) coating gives firm, easy grip

Never before a chemical and wear-resistant coated glove with such flexibility and grip. Far superior to ordinary neoprene. Most widely applicable of all coated work gloves.

Redmont heavy-duty NEOX gloves have improved safety-grip finish

Finish cured into 30% thicker NEOX coating. Won't chip or peel. Safest glove made. Seamless wearing surface, extra-wide thumb span, curved fingers.

New Grappler plastic gloves far outwear leather, other plastics

Coated with DUROX, 50% longer wearing, *non-slip* plastic, and made in new wing thumb, pre-flexed finger pattern that perfectly fits the hand.

Hand-fitting Monkey Grips with flexible plastic coating

Second only to Grapplers for long wear and made in same pattern. Fits the hand all over; no bagginess; comfortable grip.

New white Sani-Gluv meets special sanitation requirements

Liquid-proof all-white plastic coating in new hand-fitting pattern with wing thumb and pre-flexed fingers.

Improved white-fabric-lined Grab-its, approved by safety directors

Long-wearing, sure-gripping rough finished natural rubber, bonded to new and sturdier white fabric.

Test these gloves at our expense: Send brief description (on business letterhead) of your operations, materials handled and temperature condition. Without cost, we will forward samples of the type gloves we recommend for testing on-the-job. Address

Edmont Manufacturing Company., 1234 Walnut Street, Coshocton, Ohio

World's largest maker of coated industrial gloves

Edmont job-fitted gloves

Edmont

fishing for profits?

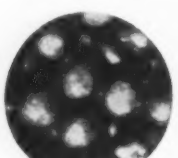
then catch on to **TRU-STEEL**

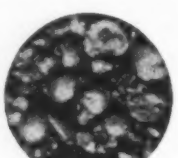
THE SHOT THAT NEVER SHATTERS

When blast cleaning abrasive starts to crumble, it loses its cleaning efficiency. Although the life of some iron abrasives has been prolonged by annealing and drawing, they still break down into the millions of sharp pieces that abrade the wearable parts of your cleaning machine.

However, a true steel shot NEVER SHATTERS. And TRU-STEEL is the only perfected true steel abrasive. Made of high-carbon steel and given a ***full*** heat treatment, it has the endurance and long life that ***only steel can give.***

TRU-STEEL after 1500 passes





CHILLED IRON after 50 passes

When you use TRU-STEEL, you save on abrasive costs, you save on maintenance material, you save on maintenance labor. How TRU-STEEL makes these savings is described in a new booklet which analyzes the cleaning dollar. Until you've tried TRU-STEEL, you can't be sure the abrasive you are using is giving you maximum life at lowest cost.

Send for your free copy of Bulletin 59-A today.

MFRD. BY STEEL SHOT PRODUCERS, INC.

American
WHEELABRATOR & EQUIPMENT CORP.
510 S. BYRKIT ST., MISHAWAKA, IND.

TRU-STEEL SHOT

PLATING SOLUTIONS:

Electrical efficiency improved by removal of impurities.

A primary cause for some electroplating troubles lies in mineral impurities which enter the bath with the water used to make up the plating bath and thereafter to compensate for evaporation and drag-out losses.

To overcome this, many platers are using demineralizing equipment and ion exchange resins engineered by the Permutit Co., New York.

Two Materials—A demineralizer utilizes two ion exchange materials; one a cation base exchanger that is capable of holding calcium, magnesium, sodium and other cations frequently present in raw water, and the second, an anion base exchanger that is capable of holding sulfate, chloride, nitrate, and depending on the type of resin employed, silica and bicarbonate ions.

Treatment of the water by these two ion exchangers, either mixed or in series, results in the complete removal of ions (metallic impurities) from the water and enables the water to be used for a wide variety of purposes, where such ions would be harmful.

Chromium—An interesting application of small demineralizer units is pointed up by the automobile industry where chromium is used to give a satisfactory appearance to trim. Being successful in the General Motors' plants of Cadillac and Pontiac, it should be applicable to other industry as well.

Among electroplaters, it is known that chromium cannot be plated directly upon steel and achieve satisfactory adhesion. It is always necessary to plate on some other metal or prepared surface.

Auto Plating—Procedure worked out over a number of years in the automotive industry is to plate a layer of copper on the steel, such as a bumper, then nickel upon the copper and then chrome upon the nickel.

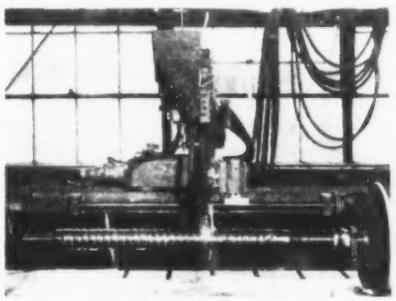
WELDING:

Submerged melt method deposits sound metal at low cost.

Severe steel mill operating conditions place terrific wear and tear on equipment. Replacement of vital parts such as mill feed-rolls, backup rolls, and press columns strains the maintenance budget.

Use of submerged melt welding has made it possible to reclaim much worn steel equipment quickly and economically. By this method, described by D. E. Knight, Linde Air Products Co., at a recent meeting of the Assn. of Iron and Steel Engineers, sound metal is deposited rapidly and uniformly, and at low cost.

Free of Defects — Resurfacing applications are usually mechanically controlled so that successive weld beads will neatly overlap to



SMALL DIAMETER shaft is rebuilt by depositing three open spirals of weld metal which overlap to form a complete cover.

produce a uniform smooth bright surface, free from defects, either on the surface or below. The Unionmelt deposit becomes an integral part of the original piece.

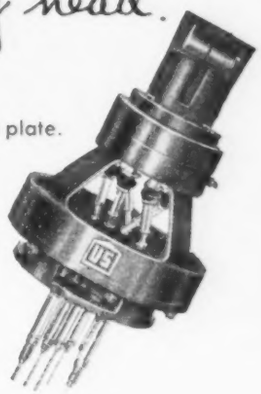
Since a considerable proportion of the repair work in steel mills is done on cylindrical surfaces, the relationship between the diameter of the piece and the welding current or speed are important factors to consider in preparing for the repair of these parts. These values may be readily determined from established data. Welding takes place beneath a cover of granulated non-metallic mineral welding composition.

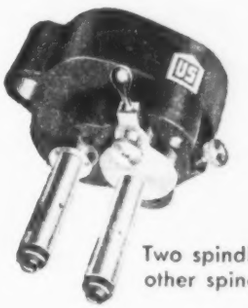
Bead Control—A helical overlapping bead is generally used in

Turn Page

COMPARE THE PRICE....
AND PERFORMANCE.....
and you'll rely on us for any type of multiple spindle fixed center, adjustable or individual lead screw tapping head.

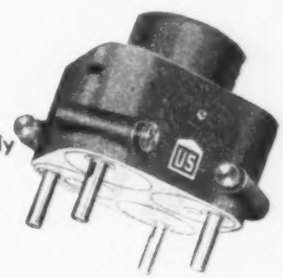
Universal joint with slip spindle fixed locating plate.





Two spindle head unit—one spindle fixed, the other spindle adjustable for the fixed positions.

Single eccentric type for equally spaced holes on bolt circles.



US HEADS
SINCE 1915

UNITED STATES DRILL HEAD CO.
CINCINNATI 4, OHIO

LOCK JOINT

Now You can fill your needs
with HELICAL TUBING

Welded and Cold Drawn
Stainless Steel Tubing
Special Purpose Tubing In All Available Materials

As Welded

Specialty

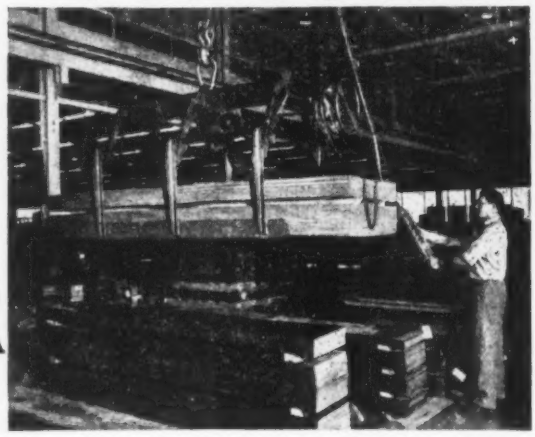
For full detailed information about Helical Tubing send today for your HETCO Catalog.

HELICAL TUBE CORPORATION
19 Washington St., East Orange, N. J.
Manufacturing Plant—Grand Rapids, Michigan

One Sure Way to CUT COSTS!

use a

C·F SHEET LIFTER



The A. B. Dick Company, Niles, Illinois, found that this C-F Lifter has substantially reduced man hours and crane time required to move stock in and out of storage.

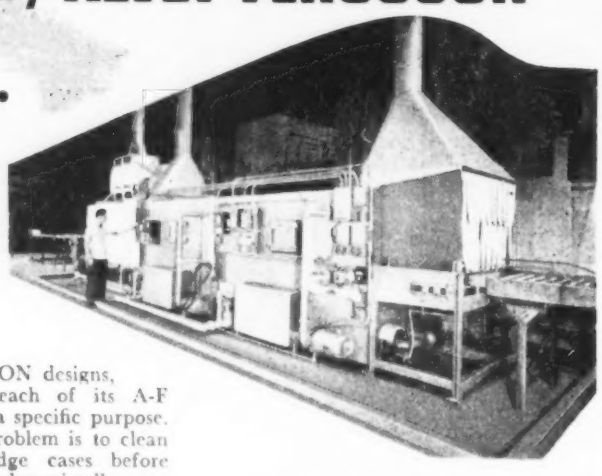
Up to 10,000 lbs. of high grade sheets in varying widths may be picked up, carried and unloaded at shears or machines with speed and economy by the Lifter and its operator.

C-F Lifters are made in standard or semi-special models to handle from 2 to 60 tons. Bulletin SL-28 describes the advantages you can obtain from C-F Lifters. Write for it today.

CULLEN-FRIESTEDT CO.
1303 South Kilbourn Avenue • Chicago 23, Illinois

"JOB ENGINEERED" by ALVEY-FERGUSON

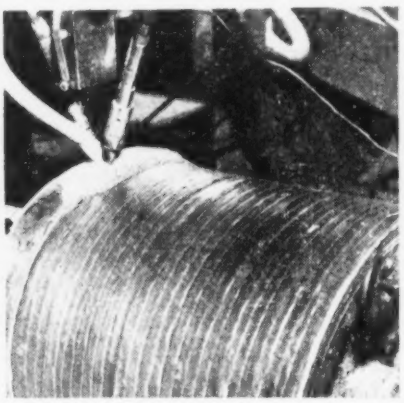
To wash... rinse... dry... cartridge cases



ALVEY-FERGUSON designs, engineers and builds each of its A-F Washing Machines for a specific purpose. Whether your plant's problem is to clean lubricants from cartridge cases before annealing, to clean and dry miscellaneous ball bearing parts without the use of baskets, remove all chips from diesel motor blocks or some other phase of quality control in your metal parts or products operation, you'll find your A-F Washing Machine as highly specialized for your specific needs as any precision equipment now in your plant. Why be satisfied with less?

For information regarding latest metal cleaning methods write, without obligation today.

THE ALVEY-FERGUSON COMPANY
A-F 568 Disney Street Cincinnati 9, Ohio
Offices or Representatives in Principal Cities



HOLLOW ROLL is easily clad with stainless steel by submerged melt welding.

surfacing cylindrical objects. Within limits, the thickness of each layer is controlled by the transverse movement of the rod. The more overlap, the greater is the thickness produced. Best results are obtained when the part is mounted in a machine providing controlled traverse, such as an engine lathe with the welding head mounted on the tool post.

Typical of the parts processed are mill table rolls, feed rolls, backup rolls, shafts, roll necks and castings and forgings for large machinery. In most instances, cost of the repair has been considerably under the cost of the new part. At the same time, the rebuilt part usually outlasts a new part replacement.

Aids Output of Lead Clad Metals

An unusual improved model automatic lead cladding and welding machine, first of its kind, was recently exhibited by Knapp Mills, Inc., at the Metal Show, Philadelphia.

The new model will clad a thickness of lead twice the thickness previously practical and will increase the previous width from a 2 in. band to a 3½ in. band. The new machine also has a regulated rate of speed.

The new machine will enable the company to substantially increase its production to meet the growing demand for lead clad metals.

Lead clad steel combines the corrosion value of lead with the strength of steel and lead clad copper combines the corrosion resistance of lead with the high heat

CARBON and SULFUR ANALYSIS with Speed! Ease! Accuracy!

TWO MINUTE CARBON DETERMINATOR

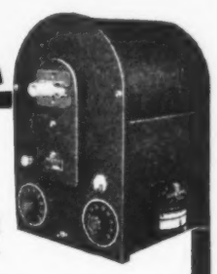
High degree of accuracy assured by: fan cooling gases, leveling to meniscus line, automatically maintaining atmospheric pressure, wide selection of carbon percentage scales. Accurate within 0.002% on low range Burette.

THREE MINUTE SULFUR DETERMINATOR

Determination in accordance with A.S.T.M. specification accuracy within 0.002% inorganic or organic materials. Simple procedure.

HIGH-TEMPERATURE FURNACE

Sturdy construction with HIGHEST QUALITY insulation.



Use 3031D Boats and Zircotubes to reduce operating cost of analysis.

Use Dietert-Detroit Carbon and Sulfur Determinators for Economical Analyses
Write to Dept. S-1 for descriptive literature

CONTROL EQUIPMENT
HARRY W. DIETERT COMPANY
9330 ROSELAWN • DETROIT 4, MICH.

transfer rate of copper and copper's excellent electrical conductivity.

IMPROVED RUBBER:

Synthetic material may be answer to deterioration problem.

The prospect of longer lasting and improved rubber products was held out by a team of Du Pont chemists recently.

They told a session of the Div. of Rubber Chemistry of the American Chemical Society details of a new Du Pont rubber-like material which may be the answer to a primary cause of deterioration in natural and many types of synthetic rubbers.

The material, known as "Hypalon" S-2 chlorosulfonated polythene, was introduced by Du Pont a few months ago and is being made in semi-commercial quantities at Belle, W. Va.

Team—The scientists were Robert T. Currin, Ward J. Remington, William B. Clark, John J. Ondrejcin, and George H. Bowers, all members of a research team from the company's Polychemicals Dept. Research laboratory at Wilmington, Del.

They pointed out that cracks in automobile tires and in other rubber products exposed to the weather result principally from the attack of ozone, a highly active form of oxygen which usually is present in the atmosphere in amounts less than ten parts per 100 million.

Turn Page

LEBANON CIRCLE L Castings

in Stainless and Special Alloys...

with Controlled High Quality

Lebanon Steel Foundry pattern makers study engineering designs, suggest improvements and plan jobs for production giving careful consideration to feed heads, rigging and gating. This care in preparation can save valuable time and eliminate costly failures. Pattern making, however, is but one of many steps in production rigidly followed by Lebanon craftsmen to provide CIRCLE (L) castings of *controlled* high quality.

LEBANON STEEL FOUNDRY
Dept. A, Lebanon, Pennsylvania
"In the Lebanon Valley"

CIRCLE L LEBANON *Steel and Alloy Steel* Castings

Coniflex* type bevel gear, used in lift truck

Three Cheers for Gears by CINCINNATI

Ever know a customer of The Cincinnati Gear Company who was anything but satisfied?

That's because we stand behind our products. If there was ever an order not right—we made it right. And that's why customers everywhere have confidence in us.

We would like to work with you too. If you have a gear problem, talk to us about it. Since 1907 we have been delivering quality gears made by expert craftsmen. So wire, write or call.

Spur
Helical
Worm
Herringbone
Internal
*Coniflex Bevel
Spiral Bevel
Spline Shaft

*Reg. U. S. Pat. Off.

THE CINCINNATI GEAR COMPANY

"Gears . . . Good Gears Only"

Wooster Pike and Mariemont Ave. • Cincinnati 27, Ohio

This PICTURE, Can be worth $1,000.00 in the SAVING of FINGERS

Amputated Fingers COME HIGH!

These figures are based on maximum rate of Illinois Workmen's Compensation from Division of Statistics and Research, Illinois Industrial Commission. (Figures for other states are higher).

LITTELL AIR BLAST VALVES

Pieces forced out safely by air. Blank parts weighing up to 2 lbs. are blown out of press with a standard Air Blast Valve.

LITTELL Pres-Vac SAFETY FEEDERS

Blanks fed from a safe distance of 14 inches. Press-Vac operates from compressed air at 45 lbs. pressure which passes through a venturi to create a vacuum.

F. J. Littell MACHINE CO. AIR DIVISION
4141 RAVENSWOOD AVE., CHICAGO 13, ILL.
— District Offices: Detroit and Cleveland —

Technical Briefs

POROSITY MEASURED:

New test measures metal casting leakage rates as low as 10^{-8}

An improved method for measuring the porosity of metal castings, believed capable of accurately measuring leakage rates as low as 10^{-8} cu ft per sq in. per hour at one atmosphere of pressure, has recently been developed at Sam Tour & Co., Inc.

The method was devised in order to measure the effectiveness of a plastic impregnant in reducing the porosity of aluminum castings to be used in high vacuum installations. Previously-used vacuum techniques of measurement gave unreliable results at low porosity levels. The new technique is based upon trapping and weighing the quantity of carbon dioxide passing through the test plate.

Carbon dioxide, of utmost purity and dryness, is introduced into a chamber and is accurately maintained at 15 psi throughout the test. The test plate forms the barrier between the two chambers. On the other side of the plate, a stream of oxygen, free of carbon dioxide, sweeps through chamber B at approximately atmospheric pressure. Because the carbon dioxide in chamber A is at a higher pressure, a quantity of the carbon dioxide (depending on the porosity of the plate) passes through the plate and enters chamber B. The oxygen flowing through chamber B carries the carbon dioxide to a carbon dioxide absorption tube. The weight of the carbon dioxide collected during a measured period of time provides the basis for calculating the leakage rate through the plate.

The vacuum method consists of evacuating one side of the plate to very low pressure—approximately 10 microns of mercury—while subjecting the other side to atmospheric pressure. Then, the rate of increase in pressure on the evacuated side, suitably corrected for system leakage, can be used as a measure of porosity. However,

the vacuum method is frequently unsatisfactory because of the difficulty of measuring small leakages with consistent accuracy. Another serious difficulty is the fact that, at low pressures, a sufficient quantity of gases may be released by the casting itself to destroy the accuracy of the measurements.

These gases can occur in the castings because, during the casting of many types of metal, an appreciable quantity of gas may be occluded or absorbed within the metal and adsorbed on all surfaces. For example, in the case of aluminum, up to 17 cc of hydrogen may be absorbed per 100 gs of metal. When the metal is subsequently subjected to vacuum, the occluded gases are liberated at various rates and enter the evacuated system. Thus, unless the vacuum system and test plate are thoroughly degassed prior to the tests—a difficult job to do completely—the release of these gases will create an "apparent leakage" which destroys the validity of the porosity tests.

The new Sam Tour & Co. method avoids this difficulty because the tests are conducted at approximately atmospheric pressure, so that the absorbed and occluded gases do not have the opportunity to escape. Accuracy is further assured because the usual sorbed and occluded gases, such as hydrogen, oxygen and nitrogen, are not picked up by the carbon dioxide absorption tube.

Turn Page

"I could tell you my system for getting a raise, but I don't think it would do you any good."

Collapsible pallet-box plus Gerrard Steel Strapping helps cut shipping costs!

● The collapsible pallet-box shown here carries 3450 lbs. of front axles. Gerrard Round Steel Strapping reinforces all six sides of the container, keeping the box rigid and the contents safe until they reach their destination. When the box is unloaded and all straps removed, the box may be quickly collapsed and its members strapped together for return shipment. Costly shipping space is thereby conserved.

Call a Gerrard engineer for detailed information about how the Gerrard Method of Strapping can help you cut shipping costs, speed up production line tying, eliminate unnecessary containers or give stronger reinforcement to cartons, boxes, crates and pallets. Write for a free copy of the *Blue Book of Packaging*.

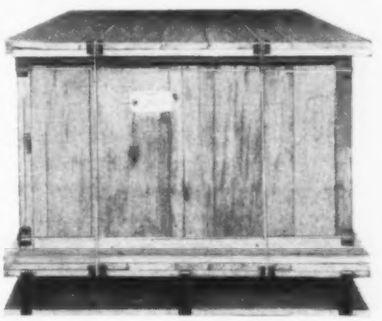


Photo courtesy of International Harvester Company, Industrial Power Division.

GERRARD STEEL STRAPPING DIVISION, UNITED STATES STEEL COMPANY
4705 South Richmond St., Chicago 32, Ill.

U·S·S GERRARD ROUND STEEL STRAPPING

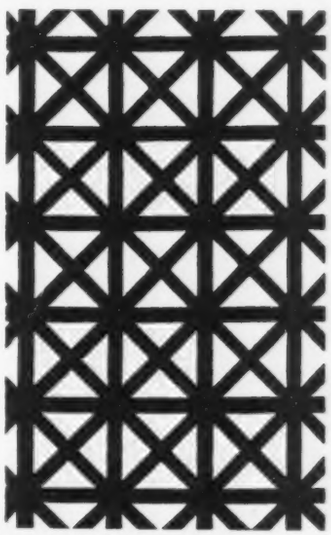
USS

UNITED STATES STEEL

Hendrick Ornametal

TRADE MARK

This is a lightweight type of grille especially suited for radiator enclosures, stove panels, kitchen cabinets, clothes and broom closets, lockers, and similar applications. It is made of a special bright finish, cold rolled steel, suitable for painting or plating, and is available in a wide range of stock size sheets and gauges.



Hendrick Ornametal can be furnished in a variety of attractive designs, the one illustrated being "Smalcane." Write for full information.

SEE OUR CATALOG IN SWEET'S

HENDRICK

Manufacturing Company

Perforated Metals
Perforated Metal Screens
Wedge-Slot Screens
Architectural Grilles
Mitco Open Steel Flooring,
Shur-Site Treads, Armorgrids

37 DUNDAFF STREET, CARBONDALE, PENNA.

Sales Offices In Principal Cities

ELECTRONIC SCALE:

Load cell used to create electronic weighing scale.

A large Chicago steel company, utilizing modern techniques in proper load distribution for their heavy trucks, ran into a difficult installation problem right at their front door.

A mechanical lever-type scale was being constructed in the street when a huge conduit, buried years ago by a power company, was found under the sidewalk. The cables were positioned directly on a level with the scale transverse lever which was to extend to the recorder inside the building.

Problem—To move the cable was impracticable from the standpoint of time and money necessary. And the mechanical scale could not be temporarily discarded because of the substantial investment put into it, and also the immediate need for an operating scale.

Streeter-Amet Co., Chicago engineers, were consulted. A basic component of an S-A electronic scale, the Baldwin SR-4 Load Cell, was installed — in conjunction with the electronic recorder—to eliminate use of the extended transverse lever. This overcame the problem of moving the power cables.

Principle—The load cell functions under the principle that electrical resistance of the strain gage inside the cell changes as stress is applied. The electronic recorder measures and prints the exact change in voltage which corresponds to the weight on the scale.

In this instance, the load cell operates with a mechanical scale, and reacts to tension. A completely electronic installation usually requires four load cells and reacts to compression.

A direct cable connection was then made from the load cell to the electronic recorder (shown in window) to accurately register the weight distribution.

The SR-4 strain gage load cell has been widely accepted as a tool for the accurate measurement of forces affecting the part to which the cell is attached.

COMPACT, FAST TRAVELING
KRANE KAR
SWING-BOOM MOBILE CRANE
CAN SWING IT!
SWINGS AND TRANSPORTS LOADS OF ANY SHAPE OR SIZE ANYWHERE IN YOUR PLANT

1½, 2½, 5 and 10 ton cap.

You don't have to face the load . . . swing the boom! It's live and handles up to 10 tons at either side. You can swing materials from a RR car right onto a waiting truck; reach into a boxcar and load it; stack piles two-deep and three-deep on both sides of aisle, increasing storage space; move loads into plant through low shop doors; work in narrow aisles and congested areas where other equipment cannot operate.

Only *KRANE KAR* can do such difficult materials-handling jobs *ECONOMICALLY* because 1—it transports full rated load; 2—tops and lowers boom by power; 3—lowers load by power; 4—has automatic crane braking at limit positions; 5—has good vision; 6—excellent traction and short turning radius; 7—gas-powered, it can work 24 hours a day.

Use *KRANE KAR* as a standby for bigger cranes and for emergency maintenance and repairs. *ASK FOR BULL. 89—STEEL, Metalworking and Metalproducing Industries.*

SILENT HOIST & CRANE CO. 851 63rd ST., BROOKLYN 20, N.Y.

RUSSELL
Cold Sawing
MACHINES

- **FULLY AUTOMATIC HYDRAULIC**
  Capacities: 3½" to 9½" rounds
- **SEMI-AUTOMATIC**
  Capacities up to 13½" rounds

ASK FOR FREE GENERAL BULLETIN EG-3

TRIPLEX MACHINE TOOL CORP.
75 West Street — New York 6, N. Y.

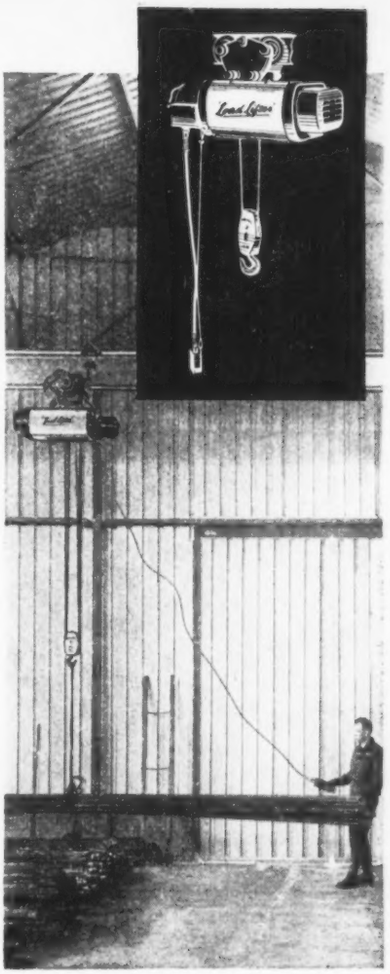
Steel Makers Since 1871

STRIP STEEL

STANLEY
Reg. U.S. Pat. Off.

Hot Rolled—
Cold Rolled
Special Carbon—
Alloys

The STANLEY WORKS
New Britain, Bridgeport, Conn.
Hamilton, Ont.



SHORT CUT TO MORE PRODUCTION

The "Series 700" 'Load Lifter' is the electric hoist for the job. It's fast — lifts a ton 30 feet a minute. It's easy to use. Push-button control eliminates muscle strain; the operator stays fit.

The 'Load Lifter' is tough, safe — has steel suspension; safety-type lower block and hook; motor and load brakes that require no attention; heat-treated helical gears; only 24 volts at the push button. Give *your* production a lift — at lower cost. Capacities: ½ ton and up. Write for 'Load Lifter' Bulletin 399.

MAXWELL MANNING & MOORE INC. TRADE MARK

'Load Lifter' ®

ELECTRIC HOISTS

MANNING, MAXWELL & MOORE, INC.

MUSKEGON, MICHIGAN

Builders of "Shaw-Box" Cranes, 'Budgit' and 'Load Lifter' Hoists and other lifting specialties. Makers of 'Ashcroft' Gauges, 'Hancock' Valves, 'Consolidated' Safety and Relief Valves, and 'American' Industrial Instruments.

—Technical Briefs—

TURBINE STARTERS:

Compressed air starters rev up turbine blades to 85,000 rpm.

Production of air turbine starters is underway at the new $5 million Phoenix plant of AiResearch Mfg. Co. of Arizona with initial deliveries to the Navy scheduled this month.

Initial starter units being produced at the Phoenix plant are in the 35-air-hp class, capable of starting a turbojet or turboprop engine in less than 15 sec. The units weigh about 17½ lb, making for minimum weight as a main engine accessory.

Background—The starter actually is an outgrowth of the company's air turbine refrigeration units which provide cooling for the cabins of both military combat and commercial transport aircraft.

As in the case of refrigeration units, the air turbine starters are operated by compressed air, which strikes the turbine blades and windmills them up to speeds above 85,000 revolutions per minute.

Power Delivery—Shaft power is taken from the turbine wheels through reduction gearing. This power is delivered through the starter's output jaw directly to the main turbojet or turboprop engine, cranking them up to firing speed and then assisting them up to idling speed.

"Miss Blat, your petticoat is showing—0.0375 in. of it."

Recovered 3 TIMES Its Cost In 2 YEARS Use . . .

No Repairs or Replacements*

**Unsolicited statement made by a Michigan user about their Titan hoist.*

THE *Titan* ELECTRIC HOIST

Material handled overhead saves valuable floor space for production.

The Titan is a powerful, little hoist with big hoist features: Improved Worm Drive, Electric Brake, Steel Wire Hoisting Rope, Push-Button Control. Capacities: 250 lbs. to 1 ton; with monorail trolley or upper hook suspension.

Write for Titan Bulletin 801A; also Bulletin 695 on light, overhead Electric Hoist Cranes.

DETROIT HOIST & MACHINE CO.

8231 Morrow St., Detroit 11, Mich.

Manufacturers in Detroit since 1905

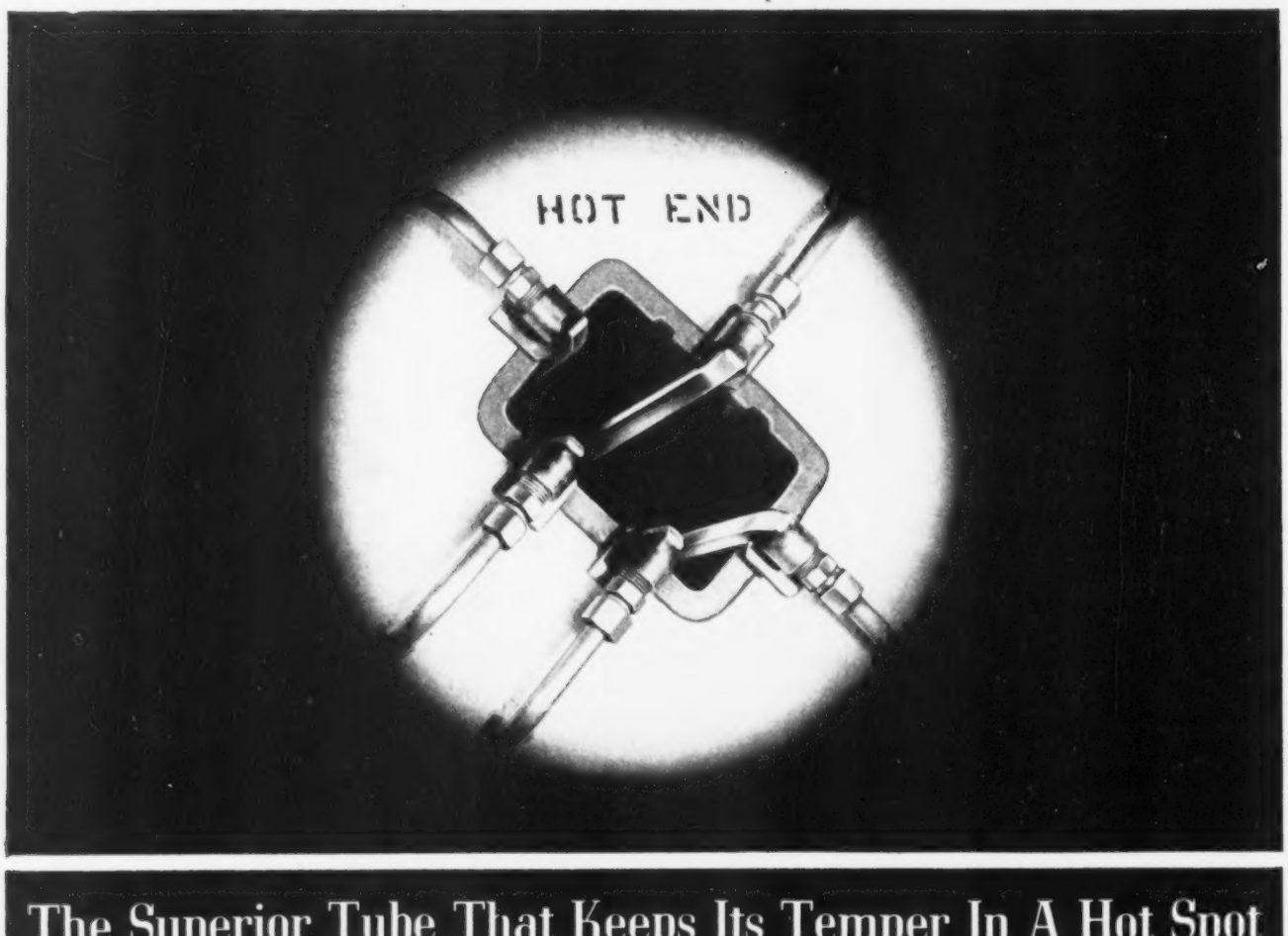
QUANTITY PRODUCTION OF GREY IRON CASTINGS

ONE OF THE NATION'S LARGEST AND MOST MODERN PRODUCTION FOUNDRIES

ESTABLISHED 1866

THE WHELAND COMPANY

CHATTANOOGA 2, TENN.



The Superior Tube That Keeps Its Temper In A Hot Spot

Producing tubing and tubular parts that stand up well even when the heat's on is a Superior specialty.

One of these parts is shown above. It is a guide rail for a TOCCO† induction hardening furnace, manufactured by The Ohio Crankshaft Co., a Superior customer.

This simple tube has to be tough. Constantly exposed to high heat, it must retain its temper, stay hard. Continually abraded by the scrubbing action of the 25 pound hot-rolled steel slugs that ride along it, it must require infrequent replacement. In addition it must not crack when brazed, or develop cracks in use.

Reading this list of requirements would suggest that the guide rail must necessarily be a brute-strong, thick-walled, heavy-weight. It isn't—it is a ⅜" square Inconel* tube with a wall only .065" thick. It is another example of fine, small tubing that does a big job well.

Producing it presented a problem—but just the type of problem we like to meet and can almost always solve. We have the right combination of engineering, research and production facilities that makes it easy for us to work closely with our customers' designers and engineers, and to produce the tubing required to fit the most exacting specifications.

If you use small tubing and have a problem it might be well to check with us. We can probably help and will be glad to do so. Write Superior Tube Company, 2004 Germantown Ave., Norristown, Pennsylvania.

BE SURE ABOUT TUBING—SPECIFY **Superior**

THE BIG NAME IN SMALL TUBING

All analyses .010" to ⅝" O.D.
Certain analyses (.035" max. wall) up to 1⅜" O.D.

West Coast: Pacific Tube Company, 5710 Smithway St. Los Angeles 22, Calif. UNderhill 0-1331

ROUND AND SHAPED TUBING

Available in:

Carbon Steels:
A.I.S.I.—C-1008, MT-1010, MT-1015, C-1118, MT-1020, C-1025, C-1035, E-1095

Alloy Steels:
A.I.S.I.—4130, 4132, 4140, 4150, 8630, E-52100

Stainless Steels:
A.I.S.I.—303, 304, 305, 309, 310, 316, 317 321, 347, 403, 410, 420, 430, 446, T-5

Nickel Alloys:
Nickel, "D Nickel"*, "L Nickel"*, "Monel"*, "K Monel"*, "Inconel"*, 30% Cupro Nickel.

Beryllium Copper

*Reg. U.S. Trademark—International Nickel Co.
†Reg. U.S. Trademark—The Ohio Crankshaft Co.

Record Fourth Quarter Expected to Speed Catch-Up

Third quarter earnings weren't so hot . . . But fourth quarter expected to be much better . . . New production records seem certain . . . Pressure for decontrol getting stronger.

Steel companies earned about 24 pct less in the third quarter of 1952 than they did in the third quarter of 1951. For the first 9 months of this year their earnings are about 38 pct below the corresponding period last year. This reflects the financial impact of the 54-day strike during June and July.

Financial results are still considered approximate, since a few companies have not yet reported their earnings. But these figures are compiled from earnings reports of companies representing the bulk of the industry's ingot capacity.

Tax Credits Help—The earnings picture would have been even darker had it not been for excess profits tax factors. Operations lower than expected permitted reduction in provision for excess profits tax made earlier this year. And some income statements reflected estimated excess profits tax refunds for 1951 arising from an unused excess profits tax exemption for the current period.

A number of steel firms chose to hold a portion of their tax credits to apply against fourth quarter earnings. This, coupled with the expectation of very high operations during the balance of the year, gives promise of much more favorable financial results for the fourth quarter of 1952.

Record Production—The outlook is for capacity operations at least through the first quarter of next year. During the second quarter of next year most steelmakers expect supply and demand to move into reasonably good balance for most products. It will take longer to whittle down order backlogs on heavy plates and structurals, large sizes of bars, and oil country goods.

New steel production records are being set almost every week. This is expected to continue as additional new capacity is brought into production. Output currently is at an annual rate of more than 116 million tons. Record high for a year is 1951 when 105.1 million tons were turned out.

Catching Up — The terrific production pace is rapidly overcoming the handicap of 19 million tons of production lost during the strike last summer. Steel for the entire industrial expansion program (as now outlined) is expected to be fully delivered during the first quarter of 1953. Eighty pct of that program is taken care of now. The industrial expansion program is not that near completion, but, as far as steel producers are concerned, demand has been met when the steel is delivered.

The government is already under pressure to further relax construction curbs, so that other projects can take up the slack as industrial building tapers off. Some construction projects which lacked high priority have been gathering cobwebs ever since Korea. It will take time to get these out, dust them off, and make necessary revisions before they can be reflected on steel order books. If these pent-up programs are given the green light in time, steelmakers believe construction business should remain good.

Controls Not Needed — Despite the fact that auto makers are battling National Production Authority for more steel during the first quarter, there are signs of some easing in demand for flat-rolled products. Wire products are in good supply now. As additional products move into balance, already-strong pressure for decontrol of steel will mount even higher. Many steel consumers, and even some Washington officials, are becoming convinced that whatever reasons there might have been for installing controls are rapidly evaporating.

Military orders delayed by the strike are now pretty well cleaned up. By the end of this month all such orders are expected to be on a current basis. In addition to taking care of current military production needs, the steel industry has been furnishing additional shipments to bring inventories of military items up to desired levels. End of this military catch-up will release additional steel production to civilian users.

Raw Materials—The industry's raw materials outlook is good. Record iron ore movement on the Great Lakes since the steel strike has apparently forestalled an ore shortage this winter. Major steel producers indicate they are no longer worried about their ore stocks. They have abandoned plans to make heavy all-rail shipments this winter.

Scrap stocks are in excellent shape. Steady buying has kept inventories at bulging levels accumulated during the strike last summer. From the steel makers' viewpoint the scrap outlook is decidedly brighter than it was last year at this time.

Steelmaking operations this week are scheduled at 107.0 pct of rated capacity, unchanged from the record operating level of the past 2 weeks.

Call Solar

for these products

Sheet and Strip
HR, HRP, CR

Cold Finished Bars & Hot Rolled Bars, both carbon & alloy

Plates

Galvanized, Long Ternes and Tin Mill Products

Seamless Tubing

Drill Rod

Welded Tubing

Maintenance Steels

for these services

Shearing
Slitting
Sawing
Flame Cutting
Flattening
Decoiling
Tempering
Edging
Pickling
Oiling
Packaging

"for service dependable as the sun"

SOLAR STEEL CORPORATION

SURE ® SPEC

DEPENDABLE AS THE SUN STEEL SERVICE

©1952

General Offices: UNION COMMERCE BUILDING, CLEVELAND, OHIO

See your local classified telephone directory for our nearest office address

SALES OFFICES: Chicago • Cincinnati • Cleveland • Detroit • Grand Rapids • Kalamazoo • Milwaukee • Nashville
New Haven • Philadelphia • River Rouge, Mich. • Rochester, N.Y. • Toledo • Union, N.J. • Washington, D.C. • Worcester, Mass.

Market Briefs and Bulletins

Back in Production—Iron-making operations at Republic Steel Corp.'s South Chicago blast furnace were resumed Oct. 25 after a 48-day shutdown for relining. Work on the furnace was finished 12 days sooner than anticipated. Nearly 20,000 tons of critically needed pig iron were saved as a result of the repair speedup.

Ferrosilicon Plentiful—Enough ferrosilicon capacity is being developed to support steel ingot production at a rate of 120 million tons industry officials have told National Production Authority. Industry has asked NPA to increase the exemption figure for inventory reports to cut down paper work. Consumers are reported to have 2 months' inventories of ferrosilicon in all categories.

Auto Sales Up—Climbing back from a July-August slump forced by the steel strike, factory sales of new motor vehicles hit a 1952 peak of 551,159 units in September, according to the Automobile Mfrs. Assn. Included in the September totals were: 438,397 passenger cars, 112,375 motor trucks and 387 motor coaches.

Demand Jumps — Sales of electrolytic iron by Plastic Metals Div., National Radiator Co., Johnstown, Pa., during the third quarter were 24 pct higher than for the same period last year. Increase is attributed to higher demand for electrolytic iron powder by compacting and electronic industries. Sales of non-ferrous metals also increased 8 pct.

Graphite Plant—Delanium Carbon Corp.'s new factory at Morton Grove, Ill., will start producing graphite cubic heat exchangers around Nov. 15. Later the plant will be used to turn out Paragrid absorption and scrubbing towers and other graphite products.

Short Strike—A 3-day "continuous" meeting on working procedures by more than 500 CIO steelworkers shut down the Pacific States Steel Corp.'s three openhearths at Niles, Calif., last week. Walkout was orderly and no wage questions were involved.

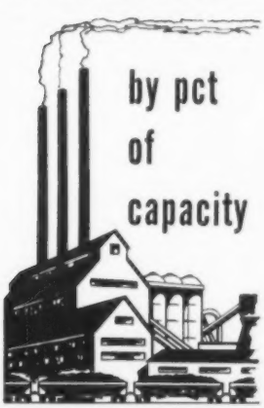
Pipe Shortage—Oil well drilling program scheduled by defense agencies faces failure if production of oil country tubular goods is not increased by at least 12 pct in 1953, states Independent Petroleum Assn. of America. This means the goal of 55,000 new wells set for next year will be missed by more than 6000 wells.

New Steel Record—For the second consecutive week, steel producton in the West hit an all-time record when operations reached 115.3 pct of rated capacity. The new mark topped the previous week's 112.8 pct which had been the previous all-time record.

Copper Shortage—A shortage of refined copper looms again if either stockpile repayments are continued or if production declines any further. National Production Authority says it has been meeting third and fourth quarter demand from import surpluses. These are no longer available. Government is urging collection and prompt shipment of every lb of copper scrap.

Steel Wages Increase—Wage earners in the iron and steel industry averaged $2.139 an hr in August, reports American Iron & Steel Institute. This pay rate was 19.7¢ an hr more than earnings in February, the last month prior to the effective date of the new wage agreement. Average work week in August was 38.2 hr as compared with 40.9 hr in February. Total employment in the industry in August was estimated at 659,800 as against 674,000 February.

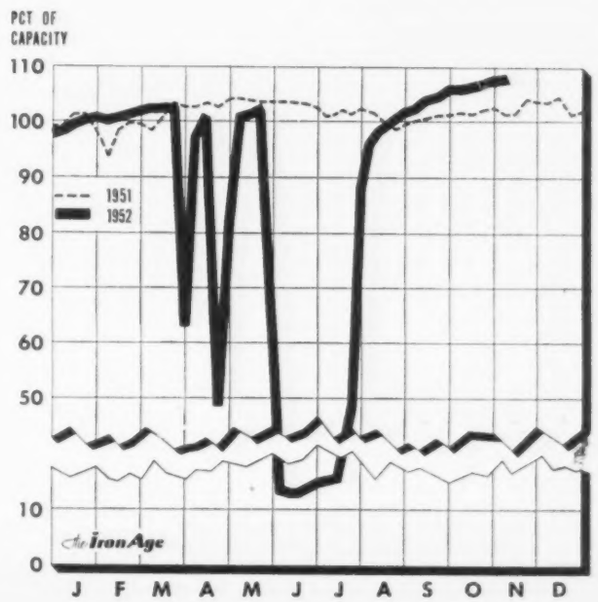
STEEL OPERATIONS



District Operating Rates

District	Week of Nov. 2	Week of Oct. 26
Pittsburgh	109.0	108.0
Chicago	111.0	111.5*
Valleys	104.0	105.0
Philadelphia	100.0	100.0
West	114.0	115.5*
Buffalo	106.0	106.0
Cleveland	103.5	96.5*
Detroit	106.0	109.0
Wheeling	100.0	100.0*
Birmingham (South)	105.5	108.0
South Ohio River	93.0	96.0
St. Louis	98.0	101.0
East	90.0	90.0
Aggregate	107.0	107.0

Beginning Jan. 1, 1952, operations are based on annual capacity of 108,587,670 net tons.
* Revised



British Have Metal in the Bank

Diversion of 22,000 tons of Canadian aluminum to U. S. plus deferment of repayment on other loan help here, reduce surplus there . . . Bolivian tin nationalized—By *R. L. Hatschek.*

This is the way allies should work together.

According to schedules the U. S. should now be producing well over 90,000 tons of aluminum per month. But Mother Nature kicked up her heels and the aluminum industry got them in the face. The acute water-power shortage has resulted in a September total of only 76,882 tons of the light metal—and the October total will be too similar. Lack of power could continue hitting production until the spring rains.

But this is a national picture. The metal is in good supply in Great Britain. Stocks there are said to top a normal working inventory by 30,000 to 40,000 tons. So the British are diverting to this country 22,000 tons of Canadian aluminum during the next 4 months and postponing the repayment of the earlier 16,500 tons that were to be sent when new facilities here came into production. (See p. 127.)

Works Out—It looks good for both sides. The U. S. aluminum supply in the early part of the year will be much improved. And the British won't have to carry such an inventory surplus in its books. Total debt of the metal will stand at 49,500 tons, lumping all loans together. It is scheduled for repayment later next year and possibly into 1955.

It's a savings account for the British — and according to the terms they can demand accelerated repayment if they run short. Neat, isn't it?

Tin Nationalized—Elsewhere in the international metals scene Bolivia has formally nationalized its tin mining industry, the main source of that country's wealth. And the source of approximately 20 pct of the world's tin. A provisional sum of about $22 million was set forth to repay the private concerns. These firms estimate the value of the nationalized mines and equipment at about $60 million but the government had previously billed them $520 million for what it called illegal profits from foreign exchange manipulations and evasion of taxes.

Larson Worried — Recent price declines in lead and zinc have been attributed to an "artificial surplus" created by the freeing and imminent freeing of these metals in London, according to Jess Larson, head of the Defense Materials Procurement Agency. He stated that a considerable number of marginal mines had already been shut down and that more closings are in the offing if prices don't rise to their earlier levels. True demand will soon catch up to curtailed production and serious shortages will result in the coming year, he said.

Meanwhile, tone of the markets for both metals has turned a bit firmer. Demand for lead is good and more metal is being sold on a flat price basis than previously. London prices are up slightly. Zinc, after descending steadily, rebounded somewhat in the Commodity Exchange.

Recommend No Ceiling — Because nearly all producers of secondary nickel alloy, ingot, waffle, and shot are selling their products below the general level of ceiling prices, there is little to be gained by the issuance of a tailored price regulation for the industry now.

Industry advisory committee members made this recommendation to the Office of Price Stabilization last week. Generally speaking, OPS was told, current selling prices of secondary nickel alloys are somewhat lower than ceiling prices set under the GCPR. However, the prices are still somewhat higher than selling prices for nickel alloys made from new materials, the agency learned.

Back To Work — Compromise — give and take by both sides—has finally brought a settlement of the 19-week strike at Scovill Mfg. Co. The shutdown put some 6000 workers off their jobs. They'll get an 11¢ per hour wage boost retroactive to Oct. 15, 1951.

MONTHLY AVERAGE PRICES

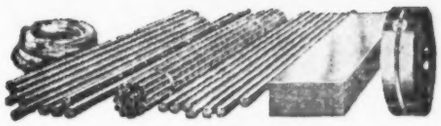
The average prices of the major nonferrous metals in October based on quotations appearing in THE IRON AGE were as follows:

	Cents Per Pound
Electrolytic copper, Conn. Valley	24.50
Lake copper, delivered	24.625
Straits tin, New York	$1.2123
Zinc, East St. Louis	13.250
Zinc, New York	14.08
Lead, St. Louis	14.204
Lead, New York	14.404

NONFERROUS METAL PRICES

	Oct. 29	Oct. 30	Oct. 31	Nov. 1	Nov. 3	Nov. 4
Copper, electro, Conn.	24.50	24.50	24.50	24.50	24.50	24.50
Copper, Lake delivered	24.625	24.625	24.625	24.625	24.625	24.625
Tin, Straits, New York	$1.21⅛	$1.21⅛	$1.21⅛	....	$1.21⅛	$1.21⅛*
Zinc, East St. Louis	12.50	12.50	12.50	12.50	12.50	12.50
Lead, St. Louis	13.30	13.30	13.30	13.30	13.30	13.30

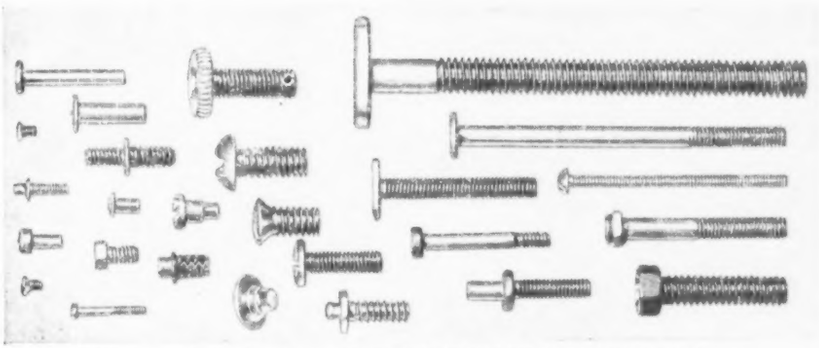
Note: Quotations are going prices.
*Tentative.



BRIDGEPORT BRASS COMPANY

COPPER ALLOY BULLETIN

"Bridgeport" MILLS IN BRIDGEPORT, CONN. AND INDIANAPOLIS, IND.—IN CANADA: NORANDA COPPER AND BRASS LIMITED, MONTREAL



A variety of precision screw products made by cold heading and roll threading. Courtesy Harvey Hubbell, Inc., Bridgeport, Connecticut.

Cold Headed Fasteners
For Economy and Strength

Mass production through clever, specialized machinery has brought about America's outstanding productivity rate with its resulting benefits. Making screw products from wire by cold heading and roll threading is an almost perfect example of mass production of a quality product at surprisingly low cost.

A modern, automatic two-blow cold heading machine, such as used for making the simpler items illustrated above, can turn out as many as 15,000 machine screw blanks (before threading) per hour. However, the average production per heading machine of the majority of the above items comes closer to 10,000 pieces per hour because they are more complicated than ordinary machine screws.

Higher Physical Properties

Not only is cold heading an economical method of production, because little or no scrap is generated, but increased strength, hardness and stiffness are attained in the finished article as compared with the properties of the wire from which it is made.

Furthermore, roll threading which is done on fast hopper-fed roll threading machines also hardens and strengthens the shank and raises the tensile strength from 5 to 8 thousands of pounds per square inch above that of the same section before roll threading. On the other hand, a cut thread weakens the metal since it removes a portion of the stock and cuts down the cross-sectional area.

In spite of the large displacement of metal involved in making a typical cold headed product, the brass or silicon bronze wire is not supplied in a soft temper. It is furnished in a drawn temper so that the unthreaded shank which generally receives less work unless extrusion is involved (reduced from wire with a larger diameter), will be as strong and stiff as possible.

In the case of Silicon Bronze alloy 609, the wire is supplied in the hard drawn condition since it is extremely ductile in all tempers. The finished cold headed, roll threaded product can easily attain a tensile strength in the neighborhood of 90,000 psi. This compares with an average of about 70,000 psi for low carbon steel screw products. Furthermore, alloy No. 609 has excellent resistance to corrosion and to stress corrosion cracking. Consequently, screw products made from this engineering alloy are used for outdoor construction, for all types of fasteners used in electrical transmission lines, pole line hardware, for boat construction and for fastening architectural bronzes.

Versatility and Low Cost

Although the size of the finished item depends upon the capacity of the heading machine, the variety of the head and the character of the threaded portion are limited only by the ingenuity of the tool designer. For this reason it pays to look into the possibility of using the cold heading method for fabricating small parts required in volume that are generally made by other methods. Using the cold heading process may possibly require some redesigning of the piece but savings in cost obtained through using cold heading methods are generally considerable.

Metal Selection

High Brass 16 (copper approximately 65%, zinc 35%) is still the favorite metal for the making of cold headed fastenings. This is primarily because of its ease of manufacture, the excellence of the product, and the lasting utility which it imparts to the finished article. Only after working with tough metals does the operator appreciate the advantages of brass, which often permits the machine to make a million pieces before dies are worn.

Silicon Bronze 609 (copper approximately 98%, silicon 2%) is finding ever wider applications because of its unusually fine physical properties.

Close metallurgical control under laboratory supervision makes possible screw wire with definite properties—a combination of good strength and excellent malleability, uniformity, and close dimensions—essentials for high speed automatic operation. Consult the nearest Bridgeport office for your metal requirements. Write on company stationery for the Bridgeport Brass "Technical Handbook" for further information on screw wire for cold heading. (8958)

Nonferrous Prices

MILL PRODUCTS

(Cents per lb, unless otherwise noted)

Aluminum

(Base 30,000 lb, f.o.b. ship. pt. frt. allowed)

Flat Sheet: 0.188 in., 2S, 3S, 31.6¢; 4S, 61S-O, 33.6¢; 52S, 35.8¢; 24S-O, 24S-OAL, 34.5¢; 75S-O, 75S-OAL, 41.9¢; 0.081 in., 2S, 3S, 32.8¢; 4S, 61S-O, 35.2¢; 52S, 37.4¢; 24S-O, 24S-OAL, 35.8¢; 75S-O, 75S-OAL, 43.9¢; 0.032 in., 2S, 3S, 34.5¢; 4S, 61S-O, 39.0¢; 52S, 41.8¢; 24S-O, 24S-OAL, 43.8¢; 75S-O, 75S-OAL, 54.8¢.

Plate ¼ in. and Heavier: 2S-F, 3S-F, 29.7¢; 4S-F, 31.7¢; 53S-F, 33.4¢; 61S-O, 32.3¢; 24S-O, 24S-OAL, 34.0¢; 75S-O, 75S-OAL, 40.7¢.

Extruded Solid Shapes: Shape factors 1 to 5, 35.5¢ to 77.2¢; 12 to 14, 36.2¢ to 93.5¢; 24 to 26, 38.7¢ to $1.22; 36 to 38, 45.9¢ to $1.79.

Rod, Rolled: 1.064 to 4.5 in., 2S-F, 3S-F, 39.4¢ to 35.2¢; cold-finished, 0.375 to 3 in., 2S-F, 3S-F, 42.5¢ to 36.8¢.

Screw Machine Stock: Rounds, 11S-Ts, ⅛ to 11/32 in., 56.2¢ to 44.1¢; ⅜ to 1½ in., 43.6¢ to 41.0¢; 1 9/16 to 3 in., 40.4¢ to 37.8¢; 17S-Ts, 1.6¢ per lb lower. Base 5000 lb.

Drawn Wire: Coiled, 0.051 to 0.374 in., 2S, 41.5¢ to 30.5¢; 52S, 50.4¢ to 36.8¢; 56S, 53.6¢ to 44.1¢; 17S-T4, 56.7¢ to 39.4¢; 61S-T4, 50.9¢ to 88.9¢.

Extruded Tubing: Rounds, 63S-T5, OD in in.: 1¼ to 2, 38.9¢ to 56.7¢; 2 to 4, 35.2¢ to 47.8¢; 4 to 6, 35.7¢ to 43.6¢; 6 to 9, 36.2¢ to 45.7¢.

Roofing Sheet: Flat, 0.019 in. x 28 in., per sheet, 72 in., $1.199; 96 in., $1.598; 120 in., $1.997; 144 in., $2.398. 0.24 in. x 28 in., 72 in., $1.448; 96 in., $1.931; 120 in., $2.414; 144 in., $2.897. Coiled sheet: 0.019 in. x 28 in., 29.6¢ per lb; 0.024 in. x 28 in., 28.2¢ per lb.

Magnesium

(F.O.B. mill, freight allowed)

Sheet and Plate: FS1-O, ¼ in. 63¢; 3/16 in., 65¢; ⅛ in., 67¢; B & S Gage 10, 68¢; 12, 72¢. Specification grade higher. Base: 30,000 lb.

Extruded Round Rod: M, diam in., ¼ to 0.311 in., 74¢; ½ to ¾ in., 57.5¢; 1¼ to 1.749 in., 53¢; 2½ to 5 in., 48.5¢. Other alloys higher. Base up to ¾ in. diam, 10,000 lb; ¾ to 2 in., 20,000 lb; 2 in. and larger, 30,000 lb.

Extruded Solid Shapes, Rectangles: M. In weight per ft, for perimeters less than size indicated, 0.10 to 0.11 lb, 3.5 in., 62.3¢; 0.22 to 0.25 lb, 5.9 in., 59.3¢; 0.50 to 0.59 lb, 8.6 in., 56.7¢; 1.8 to 2.59 lb, 19.5 in., 53.8¢; 4 to 6 lb, 28 in., 49¢. Other alloys higher. Base, in weight per ft of shape: Up to ½ lb, 10,000 lb; ½ to 1.80 lb, 20,000 lb; 1.80 and heavier, 30,000 lb.

Extruded Round Tubing: M, wall thickness, outside diam, in., 0.049 to 0.057; ¼ in. to 5/16, $1.40; 5/16 to ¾, $1.26; ½ to ⅝, 93¢; 1 to 2 in., 76¢; 0.165 to 0.219, ⅝ to ¾, 61¢; 1 to 2 in., 57¢; 3 to 4 in., 56¢. Other alloys higher. Base, OD in in.: Up to 1½ in., 10,000 lb; 1½ in. to 3 in., 20,000 lb; 3 in. and larger, 30,000.

Titanium

(100,000 lb base, f.o.b. mill)

Commercially pure and alloy grades: Sheets and strip, HR or CR, $15; Plate, HR, $12; Wire, rolled and/or drawn, $10; Bar, HR or forged, $6; Forgings, $6.

Nickel and Monel

(Base prices, f.o.b. mill)

	"A" Nickel	Monel
Sheets, cold-rolled	77	60½
Strip, cold-rolled	83	63½
Rods and bars	73	58½
Angles, hot-rolled	73	58½
Plates	75	59½
Seamless tubes	106	93½
Shot and blocks		53½

Copper, Brass, Bronze

(Freight prepaid on 200 lb)

	Sheet	Rods	Extruded Shapes
Copper	45.52		45.12
Copper, h-r		41.37	
Copper, drawn		42.62	
Low brass	42.34	42.03	
Yellow brass	40.17	39.86	
Red brass	43.10	42.79	
Naval brass	44.72	38.78	40.04
Leaded brass			38.02
Com'l bronze	44.39	44.08	
Mang. bronze	48.44	42.82	43.89
Phos. bronze	64.72	64.97	
Muntz metal	42.69	38.25	39.50
Ni silver, 10 pct	51.96	54.18	

PRIMARY METALS

(Cents per lb, unless otherwise noted)

Aluminum ingot, 99+%, 10,000 lb, freight allowed	20.00
Aluminum pig	19.00
Antimony, American, Laredo, Tex.	39.00
Beryllium copper, 3.75-4.25% Be	$1.56
Beryllium aluminum 5% Be, Dollars per lb contained Be	$69.50
Bismuth, ton lots	$2.25
Cadmium, del'd	$2.00
Cobalt, 97-99% (per lb)	$2.40 to $2.47
Copper, electro, Conn. Valley	24.50
Copper, Lake, delivered	24.625
Gold, U. S. Treas., dollars per oz.	$35.00
Indium, 99.8%, dollars per troy oz.	$2.25
Iridium, dollars per troy oz.	$2.00
Lead, St. Louis	13.30
Lead, New York	13.50
Magnesium, 99.8+%, f.o.b. Freeport, Tex., 10,000 lb.	24.50
Magnesium, sticks, 100 to 500 lb.	42.00 to 44.00
Mercury, dollars per 76-lb flask, f.o.b. New York	$191 to $193
Nickel electro, f.o.b. N. Y. warehouse	59.58
Nickel oxide sinter, at Copper Creek, Ont., contained nickel	52.75
Palladium, dollars per troy oz.	$24.00
Platinum, dollars per troy oz.	$90 to $93
Silver, New York, cents per oz.	83.25
Tin, New York	$1.21⅛
Titanium, sponge	$5.00
Zinc, East St. Louis	12.50
Zinc, New York	13.33
Zirconium copper, 50 pct	$6.20

REMELTED METALS

Brass Ingot

(Cents per lb, delivered carloads)

85-5-5-5 ingot	
No. 115	27.25
No. 120	26.75
No. 123	26.25
80-10-10 ingot	
No. 305	33.00
No. 315	30.50
88-10-2 ingot	
No. 210	41.50
No. 215	40.00
No. 245	34.50
Yellow ingot	
No. 405	23.25
Manganese bronze	
No. 421	30.50

Aluminum Ingot

(Cents per lb, 100,000 lb and over)

95-5 aluminum-silicon alloys	
0.30 copper, max.	20.6
0.60 copper, max.	20.4
Piston alloys (No. 122 type)	20.5
No. 12 alum. (No. 2 grade)	19.5
108 alloy	20.6
195 alloy	20.8
13 alloy (0.60 copper max.)	20.8
ASX-679	20.5

Steel deoxidizing aluminum, notch-bar granulated or shot

Grade 1—95-97½%	18.80
Grade 2—92-95%	18.60
Grade 3—90-92%	18.40
Grade 4—85-90%	18.20

ELECTROPLATING SUPPLIES

Anodes

(Cents per lb, freight allowed, 500 lb lots)

Copper	
Cast, oval, 15 in. or longer	37.84
Electrodeposited	33⅜
Flat rolled	38.34
Forged ball anodes	43
Brass, 80-20	
Cast, oval, 15 in. or longer	34¾
Zinc, oval	26½
Ball, anodes	25½
Nickel, 99 pct plus	
Cast	76.00
Rolled, depolarized	77.00
Cadmium	$2.15
Silver 999 fine, rolled, 100 oz lots, per troy oz, f.o.b. Bridgeport, Conn.	97½

Chemicals

(Cents per lb, f.o.b. shipping points)

Copper cyanide, 100 lb drum	63
Copper sulfate, 99.5 crystals, bbl.	12.85
Nickel salts, single or double, 4-100 lb bags, frt. allowed	27½
Nickel chloride, 375 lb drum	27½
Silver cyanide, 100 oz lots, per oz.	67¼
Sodium cyanide, 96 pct domestic 200 lb drums	19.25
Zinc cyanide, 100 lb drum	47.7

SCRAP METALS

Brass Mill Scrap

(Cents per pound, add ½¢ per lb for shipments of 20,000 to 40,000 lb; add 1¢ for more than 40,000 lb)

	Heavy	Turnings
Copper	21½	20¾
Yellow brass	19⅞	17⅞
Red brass	20¼	19⅜
Comm. bronze	20½	19¾
Mang. bronze	18½	17¾
Brass rod ends	18⅞	

Custom Smelters' Scrap

(Cents per pound, carload lots, delivered to refinery)

No. 1 copper wire	19.25
No. 2 copper wire	17.75
Light copper	16.50
Refinery brass	17.25*
Radiators	14.75

* Dry copper content.

Ingot Makers' Scrap

(Cents per pound, carload lots, delivered to refinery)

No. 1 copper wire	19.25
No. 2 copper wire	17.75
Light copper	16.50
No. 1 composition	18.50
No. 1 comp. turnings	18.25
Rolled brass	15.50
Brass pipe	16.50
Radiators	14.75

Aluminum

Mixed old cast	9 — 9¾
Mixed new clips	10 —11
Mixed turnings, dry	9 — 9½
Pots and pans	8½— 9

Dealers' Scrap

(Dealers' buying price, f.o.b. New York in cents per pound)

Copper and Brass

No. 1 heavy copper and wire	18¾—19¼
No. 2 heavy copper and wire	17 —17½
Light copper	15½—16
New type shell cuttings	15½—16
Auto radiators (unsweated)	14
No. 1 composition	17½—18
No. 1 composition turnings	17 —17½
Unlined red car boxes	16½—17
Cocks and faucets	15 —15½
Mixed heavy yellow brass	11½—12
Old rolled brass	14½—15
Brass pipe	15½—16
New soft brass clippings	16 —16½
Brass rod ends	15½—16
No. 1 brass rod turnings	15 —15½

Aluminum

Alum. pistons and struts	6½— 7
Aluminum crankcases	7½
2S aluminum clippings	10½
Old sheet and utensils	7¼
Borings and turnings	5 — 6
Misc. cast aluminum	7½— 8
Dural clips (24S)	7½

Zinc

New zinc clippings	8 — 8⅛
Old zinc	5 — 5½
Zinc routings	3½— 4
Old die cast scrap	4½— 5

Nickel and Monel

Pure nickel clippings	35 —36
Clean nickel turnings	35 —36
Nickel anodes	35 —36
Nickel rod ends	35 —36
New Monel clippings	28 —29
Clean Monel turnings	20 —21
Old sheet Monel	28 —29
Nickel silver clippings, mixed	13 —14
Nickel silver turnings, mixed	12 —13

Lead

Soft scrap, lead	10¾—11
Battery plates (dry)	5¾— 6¼
Batteries, acid free	3¾

Magnesium

Segregated solids	15 —16
Castings	14 —15

Miscellaneous

Block tin	100
No. 1 pewter	70
No. 1 auto babbitt	55 —60
Mixed common babbitt	14½—14¾
Solder joints	17½—18
Siphon tops	60
Small foundry type	18 —18½
Monotype	13½—14
Lino. and stereotype	12½—13
Electrotype	10¾—11
Hand picked type shells	8¾— 9
Lino. and stereo. dross	5
Electro dross	4½

No

- NON-FERROUS METALS
- ORES AND MINERALS
- METALLIC RESIDUES
- METAL SCRAP
- FERRO ALLOYS

- ZINC

YOUR INQUIRIES ARE SOLICITED

IRON ORE
MANGANESE ORE
CHROME ORE
TUNGSTEN ORE

Philipp Brothers, Inc.

NEW YORK 5, N. Y., Cables: PHIBRO, New York

AMSTERDAM • MONTREAL • TOKYO • BUENOS AIRES • MONTEVIDEO • LA PAZ • LIMA • CALCUTTA

Market Seen Holding for Rest of 1952

Fair but not enthusiastic buying may continue for rest of year . . . Ore shortages not seen materializing . . . What will happen next year depends on strength of operating rate.

Several scrap men, queried by THE IRON AGE, believe the fair but not overly enthusiastic buying pace of consumers will hold at present levels without much change for the rest of the year.

Ore shortages are not now expected to strike and may not serve as the market tonic expected by many scrap men earlier. For the present, the high operating rate of steel mills serves as a prime mover in scrap despite high stockpiles at the consumer level. However, dealers have not been able to fatten their scrap piles substantially.

What will happen to the scrap market of 1953 cannot yet be reckoned accurately. This depends on fluctuation of the steelmaking rate, influenced by supply's overtaking demand and the state of mill stockpiles.

In Pittsburgh, the market was uneventful. Consumers were holding comfortable inventories and mills inspected rigidly. They wanted no material that would restrict openhearth operation. Openhearth grades moved strongly in Chicago.

Pittsburgh — The market is quiet. Consumers are sitting on comfortable inventories. Inspection is rigid as the mills, reaching for higher production, reject material that might hamper output. Besides, OPS inspectors reportedly are more active in the district. Some brokers are warning that inventories today are largely in hands of consumers and this may lead to a false sense of security by the mills. On the other hand, shipments are tending to pick up after a brief decline. At least one mill has cut off shipments temporarily and another reports receipts last week as improved over the previous similar period.

Chicago — Scrap in openhearth grades continued moving well in Chicago this week, and some increased interest in rails was indicated. Blast furnace grades have been moving poorly in the past few weeks, though this material seems to sell well when direct from industrial sources. Electric furnace and malleable are quite weak. Uncleaned motor blocks were strengthened briefly by a recent sale, but most exchange of this material seem to be at the dealer level.

Philadelphia — Market here is said to be uncertain, unenthusiastic, even apathetic. Industrial activity is fair. Prices are fair to firm. Mill inventories are fair to good and they aren't pushing. Some scrap men feel stocks may be trimmed in view of possible lower operating rates next year. Electric furnace material is moving better —if it's high quality. Dealers still complain of steadily dropping intake of first rate scrap.

New York—Buying tempo of scrap consumers continues at the same fair pace. Brokers view the chances for increased buying activity as slim. Freight car shortages continue to plague this district. Some buying of cast bolstered the cast price line at same levels. One upstate mill held up deliveries of scrap but other mills took up the slack. Dealers continue to report slow yard activity. Mill stockpiles are high, of course.

Detroit — Somewhat closer inspection, particularly in secondary grades, points to a slight weakening in Detroit scrap. But prices have clung to ceiling in all grades except cast. Outstanding strength here continues in electric furnace grades. Demand for openhearth is good and blast furnace grades moved at ceiling during the week. Little except directed scrap is moving from the area and dealers are watching Pittsburgh.

Cleveland — Scrap market here is generally unchanged with steady flow keeping inventories at a high level. There is some regrading as supply and demand affect a few items. Good openhearth and blast furnace grades still command ceiling prices. Valley mills are comfortable despite last week's record ingot production.

Birmingham — Scrap dealers report that some northern mills are holding up delivery of scrap purchased recently and the market generally is dull here. A little more scrap is beginning to come into the yards, but hardly more than enough to fill orders. Electric furnaces indicate they will limit the amount of freight absorbed, which means most of their purchases will be made from nearby points. Cast market was a little more active this week, but purchases were in limited quantities.

St. Louis—Because of slow movement of scrap into this district, brokers are behind schedules in their contract shipments to the mills. There have been no cancellations and mills are giving additional time to make deliveries. This is delaying the buying movement which had been expected to start Nov. 1. Mills are eating into their stockpiles, but inventories are heavy.

Cincinnati—Demand for openhearth and electric furnace scrap is strong. Cast remains spotty but dealers and consumers agree it is finding a normal level. Yard receipts are slow but market is expected to stay at present level for the rest of the year. There were some ceiling sales of top grade cast in the area this week.

Boston—Pre-election feeling in the trade here was that the outcome of Tuesday's big doings wouldn't have any effect on scrap business—but they were still talking about it. The market continues steady with all grades at ceiling except some cast. Stove plate is off $1 and motor blocks are a bit firmer at $30.50 to $31.

West Coast—Steel mills are using the cream of their scrap piles in setting all-time ingot production rates, thus paving the way for future good markets, scrap men believe. Use of best quality scrap, of course, cuts charging time and helps quality. Machine shop turnings dropped from $17 to $14 in both San Francisco and Los Angeles last week, and No. 1 cupola cast was off another $2 to $48 in Los Angeles. No Seattle price changes.

with every order...

an extra

advantage

at no extra cost

Luntz service can be yours whether you buy scrap or sell scrap. This service includes the benefit of many years experience with scrap problems plus specialized knowledge of the entire range of scrap requirements.

Luntz service means your scrap needs are fulfilled with precision and speed -- that they are fulfilled within the same kind of high quality standards you exercise in your own plant.

Luntz service has been the industry's yardstick for generations. It's yours, at no extra cost, with every order. It can help you today.

The

LUNTZ

IRON & STEEL CO.

offices CANTON, OHIO; CLEVELAND, OHIO; KOKOMO, INDIANA; DETROIT, MICHIGAN; NEW YORK CITY

plants CANTON, OHIO; KOKOMO, INDIANA; WARREN, OHIO; HUBBARD, OHIO

Iron and Steel SCRAP PRICES

(Maximum basing point prices, per gross ton, as set by OPS in CPR 5 and amendments.)

Switching Charge (Dollars per gross ton) →	$0.99	.75	.53	.65	.75	.61	.75	.75	.61	.51	.75	.70	.76	.83	.65	.26	1.34	.79	.50	.20	.52	.47	.51	.51	.51	.95	.50	.78	.50	.43	.51	.33	.57	.66	.65	.62	.66	.66
Basing Points →	Pittsburgh	Johnstown	Brackenridge	Butler	Midland	Monessen	Sharon	Youngstown	Canton	Steubenville	Warren	Wellton	Cleveland	Buffalo	Cincinnati	Middletown	Chicago	Claymont	Coatesville	Conshohocken	Harrisburg	Phoenixville	Sparrows Pt.	Bethlehem	Ashland, Ky.	Kokomo, Ind.	Portsmouth, O.	St. Louis	Detroit	Duluth	Kansas City	Birmingham	Alabama City	Atlanta	Minneapolis	Houston	Los Angeles	Pittsburg, Cal.	Portland, Ore.	San Francisco	Seattle
GRADES	OPS No.																																							
No. 1 bundles	1	$44.00						$44.00					$43.00				$42.50						$42.00					$41.00	$41.15	$40.00	$39.50	$39.00			$38.00	$37.00	$35.00				
No. 1 busheling	2	44.00						44.00					43.00				42.50						42.00					41.00	41.15	40.00	39.50	39.00			38.00	37.00	35.00				
No. 1 heavy melting	3	43.00						43.00					42.00				41.50						41.00					40.00	40.15	39.00	38.50	38.00			37.00	36.00	34.00				
No. 2 heavy melting	4	43.00						43.00					42.00				41.50						41.00					40.00	40.15	39.00	38.50	38.00			37.00	36.00	34.00				
No. 2 bundles	5	43.00						43.00					42.00				41.50						41.00					40.00	40.15	39.00	38.50	38.00			37.00	36.00	34.00				
Machine shop turnings	6	34.00						34.00					33.00				32.50						32.00					31.00	31.15	30.00	29.50	29.00			28.00	27.00	25.00				
Mixed borings and turnings	7	38.00						38.00					37.00				36.50						36.00					35.00	35.15	34.00	33.50	33.00			32.00	31.00	29.00				
Shoveling turnings	8	38.00						38.00					37.00				36.50						36.00					35.00	35.15	34.00	33.50	33.00			32.00	31.00	29.00				
Cast iron borings	10	38.00						38.00					37.00				36.50						36.00					35.00	35.15	34.00	33.50	33.00			32.00	31.00	29.00				
No. 1 chemical borings	26	41.00						41.00					40.00				39.50						39.00					38.00	38.15	37.00	36.50	36.00			35.00	34.00	32.00				
Forge crops	11	51.50						51.50					50.50				50.00						49.50					48.50	48.65	47.50	47.00	46.50			45.50	44.50	42.50				
Bar crops and plate	12	49.00						49.00					48.00				47.50						47.00					46.00	46.15	45.00	44.50	44.00			43.00	42.00	40.00				
Punchings and plate	14	46.50						46.50					45.50				45.00						44.50					43.50	43.65	42.50	42.00	41.50			40.50	39.50	37.50				
Electric furnace bundles	15	46.00						46.00					45.00				44.50						44.00					43.00	43.15	42.00	41.50	41.00			40.00	39.00	37.00				
Cut struc., plate, 3 ft and less	16	47.00						47.00					46.00				45.50						45.00					44.00	44.15	43.00	42.50	42.00			41.00	40.00	38.00				
Cut struc., plate, 2 ft and less	17	49.00						49.00					48.00				47.50						47.00					46.00	46.15	45.00	44.50	44.00			43.00	42.00	40.00				
Cut. struc., 1 ft and less	18	50.00						50.00					49.00				48.50						48.00					47.00	47.15	46.00	45.50	45.00			44.00	43.00	41.00				
Foundry steel, 2 ft and less	20	44.00						44.00					43.00				42.50						42.00					41.00	41.15	40.00	39.50	39.00			38.00	37.00	35.00				
Foundry steel, 1 ft and less	21	46.00						46.00					45.00				44.50						44.00					43.00	43.15	42.00	41.50	41.00			40.00	39.00	37.00				
Heavy trimmings	24	43.00						43.00					42.00				41.50						41.00					40.00	40.15	39.00	38.50	38.00			37.00	36.00	34.00				
No. 1 RR heavy melting	RR 1	46.00						46.00					45.00				44.50						44.00					43.00	43.15	42.00	41.50	41.00			40.00	39.00	37.00				
Scrap rails, random lengths	RR 14	48.00						48.00					47.00				46.50						46.00					45.00	45.15	44.00	43.50	43.00			42.00	41.00	39.00				
Scrap rails, 3 ft and less	RR 16	51.00						51.00					50.00				49.50						49.00					48.00	48.15	47.00	46.50	46.00			45.00	44.00	42.00				
Scrap rails, 2 ft and less	RR 17	52.00						52.00					51.00				50.50						50.00					49.00	49.15	48.00	47.50	47.00			46.00	45.00	43.00				
Scrap rails, 18 in. and less	RR 18	54.00						54.00					53.00				52.50						52.00					51.00	51.15	50.00	49.50	49.00			48.00	47.00	45.00				
Rerolling rails	RR 15	53.00						53.00					52.00				51.50						51.00					50.00	50.15	49.00	48.50	48.00			47.00	46.00	44.00				
Uncut tires	RR 20	48.00						48.00					47.00				46.50						46.00					45.00	45.15	44.00	43.50	43.00			42.00	41.00	39.00				
Cut tires	RR 21	51.00						51.00					50.00				49.50						49.00					48.00	48.15	47.00	46.50	46.00			45.00	44.00	42.00				
Cut bolsters and side frames	RR 23	49.00						49.00					48.00				47.50						47.00					46.00	46.15	45.00	44.50	44.00			43.00	42.00	40.00				
RR specialties	RR 24, 28, 29	51.00						51.00					50.00				49.50						49.00					48.00	48.15	47.00	46.50	46.00			45.00	44.00	42.00				
Solid steel axles	RR 25	58.00						58.00					57.00				56.50						56.00					55.00	55.15	54.00	53.50	53.00			52.00	51.00	49.00				
No. 3 steel wheels	RR 27	51.00						51.00					50.00				49.50						49.00					48.00	48.15	47.00	46.50	46.00			45.00	44.00	42.00				
Unassorted	RR 35	40.00						40.00					39.00				38.50						38.00					37.00	37.15	36.00	35.50	35.00			34.00	33.00	31.00				

Cast Scrap Ceilings

Prices set by CPR 5, OPS

(F.o.b. all shipping points)

Grades	OPS No.	
Cupola cast	1	$49.00
Charging box cast	2	47.00
Heavy breakable cast	3	45.00
Cast iron brake shoes	5	41.00
Stove plate	6	46.00
Clean auto cast	7	52.00
Unstripped motor blocks	8	43.00
Cast iron carwheels	9	47.00
Malleable	10	55.00
Drop broken mach'y cast	11	52.00

Ceiling price of clean cast iron foundry runout or prepared cupola drops is 75 pct of corresponding grade.

Under Ceiling Scrap Prices

Pittsburgh

Machine shop turnings	$32.00
No. 1 machinery cast	52.00
Heavy breakable cast	45.00
Malleable	55.00

Chicago

Low phos. forge crops	$50.00 to $51.00
Cut struc., plate, 3 ft & less	44.50 to 45.50
Cut struc., plate, 2 ft & less	46.50 to 47.50
Cut struc., plate, 1 ft & less	47.50 to 48.50
Machine shop turnings	30.00 to 31.50
Mixed borings, turnings	34.00 to 35.50
Shoveling turnings	34.00 to 35.50
Cast iron borings	34.00 to 35.50
Cupola cast	44.00 to 45.00
Heavy breakable cast	41.00 to 42.00
Malleable	49.00 to 50.00
Stove plate	42.00 to 43.00
Clean auto cast	47.00 to 49.00
Charging box cast	43.00 to 44.00
Drop broken mach'y	48.00 to 49.00
Unstripped motor blocks	36.00 to 37.00
Cast iron brake shoes	41.00

Philadelphia Area

Clean cast chem. borings	$36.50 to $37.00
Cupola cast	47.00 to 48.00
Unstripped motor blocks	34.00 to 36.00
Charging box cast	45.00 to 46.00

Cleveland

Cast iron borings	$34.00 to $34.50
Stove plate	45.00 to 46.00
Malleable	54.00 to 55.00

Youngstown

Cast iron borings	$35.00 to $35.50

Buffalo

No. 1 machinery cast	$49.00 to $50.00
No. 1 cupola cast	46.00 to 47.00

Birmingham

Shoveling turnings	$30.00 to $32.00
Cast iron borings	30.00 to 32.00
No. 1 machinery cast	47.00 to 49.00
Stove plate	41.50 to 42.50
Charging box cast	39.00 to 40.00
Heavy breakable	37.00 to 38.00
Drop broken machinery	46.00 to 47.00
Unstripped motor blocks	39.00 to 40.00

New York

Brokers' Buying prices per gross ton, on cars:

Clean cast chem. borings	$30.00 to $30.50
No. 1 machinery cast	47.00 to 49.00
Mixed yard cast	43.00
Charging box cast	43.00 to 44.00
Heavy breakable cast	44.00 to 45.00
Unstripped motor blocks	34.00 to 35.00

Boston

Brokers' Buying prices per gross ton, on cars:

Mixed cupola cast	$38.00 to $39.00
Heavy breakable cast	39.00 to 40.00
Stove plate	37.00 to 38.00
Unstripped motor blocks	30.50 to 31.00

Detroit

Brokers' Buying prices per gross ton, on cars:

No. 1 cupola cast	$48.00
Heavy breakable cast	$43.00 to 44.00
Stove plate	43.00 to 44.00
Cast iron brake shoes	39.00 to 40.00

Cincinnati

No. 1 cupola cast	$49.00
Stove plate	46.00
Drop broken cast	$51.00 to $52.00

St. Louis

Charging box cast	$43.00 to $44.00
No. 1 cupola cast	43.00
Heavy breakable cast	41.00 to 42.00
Unstripped motor blocks	$38.00

San Francisco

No. 2 heavy melting	$31.00
No. 2 bundles	29.00
Machine shop turnings	14.00
No. 1 cupola cast	44.00

Los Angeles

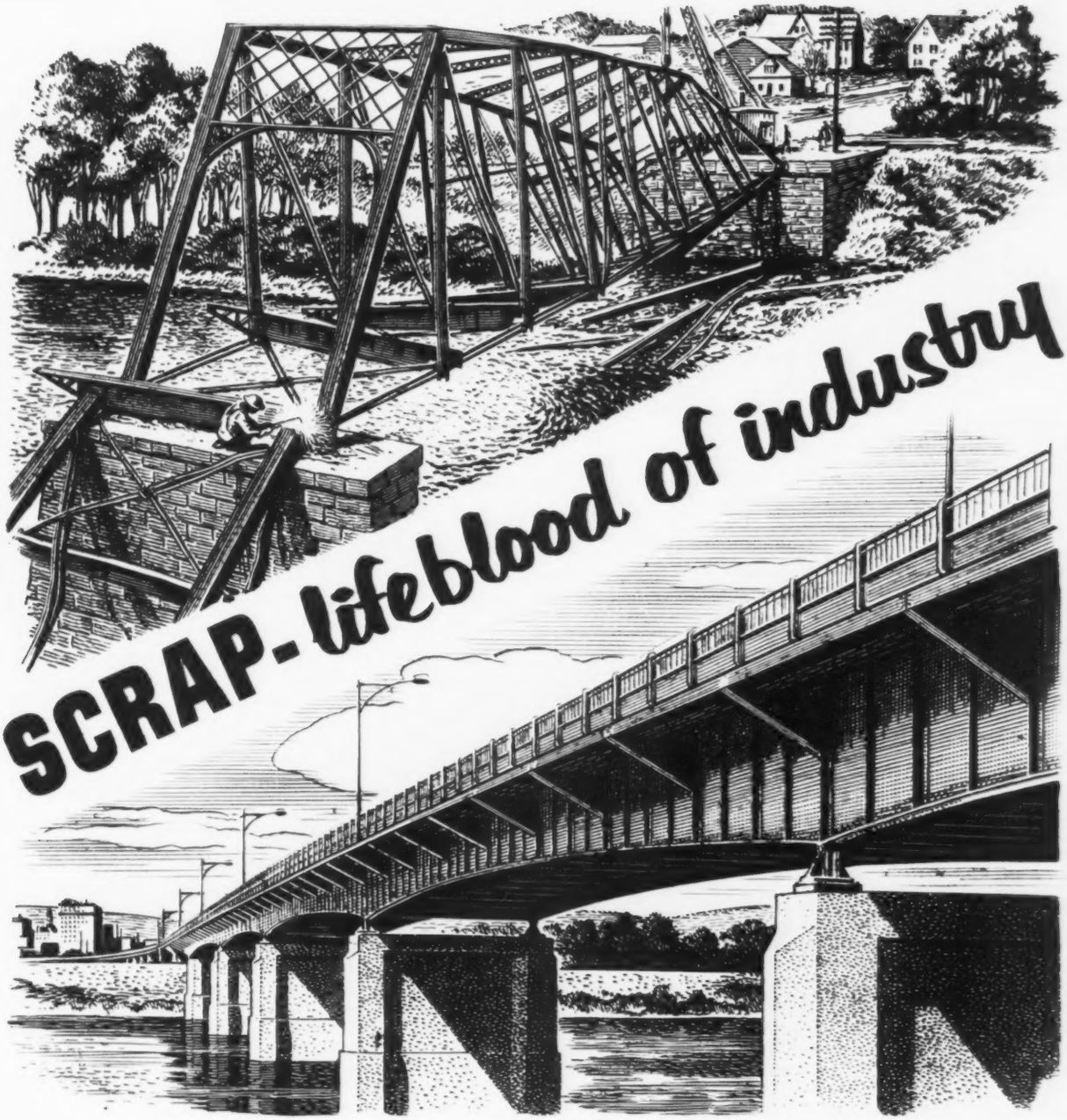
No. 2 heavy melting	$31.00
No. 2 bundles	29.00
Machine shop turnings	14.00
Shoveling turnings	20.00
No. 1 cupola cast	48.00

Seattle

No. 2 bundles	$29.00
No. 1 cupola cast	43.00
Heavy breakable	35.50

Hamilton, Ont.

No. 1 hvy. melting	$35.50
No. 1 bundles	35.50
No. 2 bundles	35.00
Mechanical bundles	33.50
Mixed steel scrap	31.50
Mixed borings, turnings	32.50
Rails, remelting	35.50
Rails, rerolling	44.50
Bushelings	30.50
Bush, new fact. prep'd	33.50
Bush, new fact. unprep'd	32.50
Short steel turnings	32.50
Cast scrap	50.00



CONSULT OUR NEAREST OFFICE FOR THE PURCHASE AND SALE OF SCRAP

LURIA BROTHERS AND COMPANY, INC.

MAIN OFFICE
LINCOLN-LIBERTY BLDG.
Philadelphia 7, Penna.

PLANTS

LEBANON, PENNA. DETROIT (ECORSE), MICHIGAN
READING, PENNA.
MODENA, PENNA. PITTSBURGH, PENNA.
ERIE, PENNA

OFFICES

BIRMINGHAM, ALA. DETROIT, MICH. PITTSBURGH, PENNA.
BOSTON, MASS. HOUSTON, TEXAS PUEBLO, COLORADO
BUFFALO, N. Y. LEBANON, PENNA. READING, PENNA.
CHICAGO, ILLINOIS LOS ANGELES, CAL. ST. LOUIS, MO.
CLEVELAND, OHIO NEW YORK, N. Y. SAN FRANCISCO, CAL.
SEATTLE, WASH.

LEADERS IN IRON AND STEEL SCRAP SINCE 1889

Comparison of Prices

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Price advances over previous week are printed in Heavy Type; declines appear in *Italics*.

	Nov. 4 1952	Oct. 28 1952	Oct. 7 1952	Nov. 6 1951
Flat-Rolled Steel: (per pound)				
Hot-rolled sheets	3.775¢	3.775¢	3.775¢	3.60¢
Cold-rolled sheets	4.575	4.575	4.575	4.35
Galvanized sheets (10 ga)	5.075	5.075	5.075	4.80
Hot-rolled strip	3.725	3.725	3.725	3.50
Cold-rolled strip	5.20	5.20	5.20	4.75
Plate	3.90	3.90	3.90	3.70
Plates wrought iron	9.00	9.00	9.00	7.85
Strains C-R strip (No. 302)	36.75†	36.75†	36.75†	36.75
Tin and Terneplate: (per base box)				
Tinplate (1.50 lb.) cokes	$8.95	$8.95	$8.95	$8.70
Tinplate, electro (0.50 lb.)	7.65	7.65	7.65	7.40
Special coated mfg. ternes	7.75	7.75	7.75	7.50
Bars and shapes: (per pound)				
Merchant bars	3.95¢	3.95¢	3.95¢	3.70¢
Cold finished bars	4.925	4.925	4.925	4.55
Alloy bars	4.675	4.675	4.675	4.30
Structural shapes	3.85	3.85	3.85	3.65
Stainless bars (No. 302)	31.50†	31.50†	31.50†	31.50
Wrought iron bars	10.05	10.05	10.05	9.50
Wire: (per pound)				
Bright wire	5.225¢	5.225¢	5.225¢	4.85¢
Rails: (per 100 lb)				
Heavy rails	$3.775	$3.775	$3.775	$3.60
Light rails	4.25	4.25	4.25	4.00
Semifinished Steel: (per net ton)				
Rerolling billets	$59.00	$59.00	$59.00	$56.00
Slabs, rerolling	59.00	59.00	59.00	56.00
Forging billets	70.50	70.50	70.50	66.00
Alloy blooms, billets, slabs	76.00	76.00	76.00	70.00
Wire Rod and Skelp: (per pound)				
Wire rods	4.325¢	4.325¢	4.325¢	4.10¢
Skelp	3.55	3.55	3.55	3.35

†Add 4.7 pct.

Composite: (per pound)				
Finished steel base price	4.376¢	4.376¢	4.376¢	4.131¢
Pig Iron: (per gross ton)				
Foundry, del'd Phila.	$60.69	$60.69	$60.69	$57.97
Foundry, Valley	55.00	55.00	55.00	52.50
Foundry, Southern, Cin'ti	58.93	58.93	58.93	55.58
Foundry, Birmingham	51.38	51.38	51.38	48.88
Foundry, Chicago†	55.00	55.00	55.00	52.50
Basic del'd Philadelphia	59.77	59.77	59.77	57.09
Basic, Valley furnace	54.50	54.50	54.50	52.00
Malleable, Chicago†	55.00	55.00	55.00	52.50
Malleable, Valley	55.00	55.00	55.00	52.50
Charcoal, Chicago	78.34	78.34	78.34	70.56
Ferromanganese	226.25	226.25	226.25	186.25

†The switching charges for delivery to foundries in the Chicago district is $1 per ton.

‡Average of U. S. prices quoted on Ferroalloy pages.

Composite: (per gross ton)				
Pig iron	$55.26	$55.26	$55.26	$52.72
Scrap: (per gross ton)				
No. 1 steel, Pittsburgh	$43.00*	$43.00*	$43.00*	$43.00*
No. 1 steel, Phila. area	41.50*	41.50*	41.50*	41.50*
No. 1 steel, Chicago	41.50*	41.50*	41.50*	41.50*
No. 1 bundles, Detroit	41.15*	41.15*	41.15*	41.15*
Low phos., Youngstown	46.50*	46.50*	46.50*	46.50*
No. 1 cast, Pittsburgh	49.00†	49.00†	49.00†	49.00†
No. 1 cast, Philadelphia	47.50	47.50	47.50	49.00†
No. 1 cast, Chicago	44.50	44.50	45.50	49.00†

* Basing pt., less broker's fee. † Shipping pt., less broker's fee.

Composite: (per gross ton)				
No. 1 heavy melting scrap	$42.00	$42.00	$42.00	$42.00
Coke, Connellsville: (per net ton at oven)				
Furnace coke, prompt	$14.75	$14.75	$14.75	$14.75
Foundry coke, prompt	17.75	17.75	17.75	17.75
Nonferrous Metals: (cents per pound to large buyers)				
Copper, electrolytic, Conn.	24.50	24.50	24.50	24.50
Copper, Lake, Conn.	24.625	24.625	24.625	24.625
Tin, Straits, New York	$1.21⅛†	$1.21⅛	$1.21⅜	$1.03
Zinc, East St. Louis	12.50	12.50	13.50	19.50
Lead, St. Louis	13.30	13.30	15.80	18.80
Aluminum virgin ingot	20.00	20.00	20.00	19.00
Nickel, electrolytic	59.58	59.58	59.58	59.58
Magnesium, ingot	24.50	24.50	24.50	24.50
Antimony, Laredo, Tex	39.00	39.00	39.00	42.00

† Tentative.

Composite Price Notes

Finished Steel Composite

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold-rolled sheets and strips, representing major portion of finished steel shipment. Index recapitulated in Aug. 28, 1941, issue and in May 12, 1949.

Starting with the issue of May 12, 1949, the weighted finished steel composite was revised for the years 1941 to date. The weights used are based on the average product shipments for the 7 years 1937 to 1940 inclusive and 1946 to 1948 inclusive. The use of quarterly figures has been eliminated because it was too sensitive. (See p. 139 of May 12, 1949, issue.)

Pig Iron Composite

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Scrap Steel Composite

Average of No. 1 heavy melting steel scrap delivered to consumers at Pittsburgh, Philadelphia and Chicago.

Warehouse Price Notes

Base Quantities (Standard unless otherwise keyed): Cold finished bars; 2000 lb or over Alloy bars: 1000 to 1999 lb. All others: 2000 to 9999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may not be combined with each other or with galvanized sheets, for quantity.

Exceptions: (1)500 to 1499 lb, (2)1500 to 3499 lb, (3)6000 lb or over, (4)450 to 1499 lb.

Base price, f.o.b., dollars per 100 lb.

WAREHOUSES		Sheets			Strip		Plates	Shapes	Bars		Alloy Bars			
Cities	City Delivery Charge	Hot-Rolled	Cold-Rolled (15 gage)	Galvanized (10 gage)	Hot-Rolled	Cold-Rolled		Standard Structural	Hot-Rolled	Cold-Finished	Hot-Rolled A 4615 As rolled	Hot-Rolled A 4140 Annealed	Cold-Drawn A 4615 As rolled	Cold-Drawn A 4140 Annealed
Baltimore	$.20	5.81	7.17	8.42–8.57	6.42	.....	6.30–6.47	6.47	6.41–6.71	7.18–7.43	.....	.....	.....	.....
Birmingham	.15	5.80	6.65	7.70[1]	5.80	.....	6.10	5.95–6.71	5.80	8.25–8.40	.....	.....	.....	.....
Boston	.20	6.48–6.52	7.35–7.52	8.59–8.74	6.55	8.50[3]	6.75–6.80	6.56–6.75	6.38–6.54	7.10–7.63	10.78	11.15–11.18	.....	13.18
Buffalo	.20	5.76–5.80	6.60–6.65	8.40–8.46	6.16–6.21	6.19	6.26–6.37	5.96–6.08	5.76–5.90	6.00–6.95	10.70	11.00–11.07	12.70	12.51–14.42
Chicago	.20	5.80–5.81	6.65	8.05	5.83–5.84	.....	5.95–6.00	5.95–6.98	5.83	6.56–6.92	.....	10.65	.....	12.65
Cincinnati	.15	6.13	6.72	8.52	6.14	.....	6.47	6.42	6.13	7.16	.....	11.07	.....	13.07
Cleveland	.20	5.80–5.81	6.65	8.16–8.19	6.00–6.01	.....	6.12–6.17	6.28–	5.89	6.66–6.90	.....	10.79	.....	12.79
Denver	.....	7.17	.....	.....	7.43–7.69	8.90	7.37	7.50–7.80	7.61–7.71	8.24	.....	.....	.....	.....
Detroit	.20	6.00–6.07	6.81–6.92	8.69	6.13	7.99	6.45–6.47	6.12–6.45	6.12–	6.975–7.21	10.72	10.92	12.72	13.02
Houston	.20	6.74–6.79	7.78–7.79	8.68	6.61–6.75	9.80	6.63–7.07	6.66–6.79	6.82–6.98	9.00–9.62	11.90	11.90	.....	13.90
Indianapolis	del'd.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Kansas City	.20	6.47	7.31	8.50–8.72	6.51	8.07	6.62–6.67	6.62	6.50	7.57	11.15–11.90	11.45–12.20	13.13–13.88	13.43–14.18
Los Angeles	.20	6.60	8.45–8.49	9.75–10.60	6.75–6.78	9.15	6.66–6.71	6.60–6.64	6.60–6.62	9.36–8.69	.....	12.05	.....	14.60
Memphis	.10	6.56	.....	.....	6.60	.....	6.71	6.71	6.57–6.83	7.98–9.98	.....	.....	.....	.....
Milwaukee	.20	5.97–5.98	6.82	8.22	6.00–6.01	.....	6.12–6.17	6.12	6.00	6.83–7.07	.....	10.82	.....	12.82
New Orleans	.15	6.28	7.12	.....	6.32	.....	6.43	6.43	6.31	7.85	.....	.....	.....	.....
New York	.30	6.26–6.69	7.27–7.60	8.31[2]–8.68	6.56–7.05	9.53	6.60–7.19	6.39–6.70	6.59–6.89	7.53–8.05	10.74–10.98	11.04–11.28	12.74–12.97	13.04–13.27
Norfolk	.20	7.10	.....	.....	6.81	.....	6.64	7.25	6.44	8.45	.....	.....	.....	.....
Philadelphia	.25	6.11–6.38	7.13–7.92	8.35–8.79	6.45–7.45	.....	6.24–6.86	6.17–6.42	6.42–6.68	7.45–7.69	10.57–10.74	10.79–11.04	12.74	12.79–13.04
Pittsburgh	.20	5.80–5.81	6.65	8.05–8.45	5.94–5.97	.....	5.95	5.95	5.83	6.66–6.90	.....	10.65	.....	12.65
Portland	.20	7.60–7.90	9.00–9.45	10.25	7.60–7.65	.....	7.30	7.30	7.35	9.45	.....	.....	.....	.....
Salt Lake City	.20	8.30	.....	10.90[4]	8.45	.....	7.85	8.00	8.40	.....	.....	.....	.....	.....
San Francisco	.15	6.90–	8.20	9.60–10.40	6.75–6.90	9.25–9.70	6.75	6.50–6.70	6.65–	8.40–8.70	.....	12.05	.....	14 60
Seattle	.20	7.16	8.83	9.80	7.69	.....	7.04	6.75	7.24	9.42	.....	11.70	.....	13.70
St. Louis	.20	6.10–6.30	6.94–7.83	8.35–8.39	6.14	9.73	6.35–6.60	6.35	6.13–6.33	6.96–7.40	10.65	10.95	12.65	12.95
St. Paul	.15	6.47	7.31	8.71	6.50	.....	6.61	6.61	6.49	7.32	.....	.....	.....	.....

SAVE TIME...SAVE MONEY

Take Advantage of

*CONTINENTAL WIRE SERVICE

Stop struggling with production problems caused by using wire not right for the job. Let Continental help you. It's easier—quicker to profit from our years of experience. Continental makes wire for more than a thousand uses . . . for almost any need. Get the wire that's right for each job. Take advantage of this helpful wire service by calling Continental at Kokomo, Indiana today.

*Trade Mark Reg. U. S. Pat. Off.

CONTINENTAL
STEEL CORPORATION

GENERAL OFFICES • KOKOMO, INDIANA

PRODUCERS OF *Manufacturer's Wire* in many sizes, KOKOTE, Flame-Sealed, Coppered, Tinned, Annealed, ALSO, Coated and Uncoated Steel Sheets, Nails,

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		INGOTS		BILLETS, BLOOMS, SLABS			PIPE SKELP	PILING	SHAPES STRUCTURALS		STRIP			
		Carbon Forging Net Ton	Alloy Net Ton	Carbon Rerolling Net Ton	Carbon Forging Net Ton	Alloy Net Ton		Sheet Steel	Carbon	Hi Str Low Alloy	Hot-rolled	Cold-rolled	Hi Str. H.R. Low Alloy	Hi Str. C.R. Low Alloy
EAST	Bethlehem, Pa.					$76.00 *B3*			3.90 *B3*	5.80 *B3*				
	Buffalo, N. Y.			$59.00 *B3*	$70.50 *B3, R3*	$76.00 *B3, R3*		4.675 *B3*	3.90 *B3*	5.80 *B3*	3.725 *B3, R3*	5.10 *B3*	5.70 *B3*	7.90 *B3*
	Claymont, Del.													
	Coatesville, Pa.													
	Conshohocken, Pa.				$77.50 *A2*	$83.00 *A2*					4.125 *A2*		5.90 *A2*	
	Harrisburg, Pa.													
	Hartford, Conn.													
	Johnstown, Pa.			$59.00 *B3*	$70.50 *B3*	$76.00 *B3*			3.90 *B3*	5.80 *B3*	3.725 *B3*			
	Newark, N. J.													
	New Haven, Conn.											5.60 *A5* 5.85 *D1*		
	Phoenixville, Pa.								6.10 *P2*					
	Putnam, Conn.													
	Sparrows Pt., Md.										3.725 *B3*	5.10 *B3*	5.70 *B3*	7.90 *B3*
	Worcester, Mass.													
	Trenton, N. J.											6.45 *R4*		
MIDDLE WEST	Alton, Ill.										4.20 *L1*			
	Ashland, Ky.										3.725 *A7*			
	Canton-Massillon, Ohio				$70.50 *R3*	$76.00 *R3* $78.00 *T5*								
	Chicago, Sterling, Ill.			$59.00 *U1*	$70.50 *U1, R3,W8*	$76.00 *U1, R3,W8*		4.675 *U1*	3.85 *U1, W8*	5.80 *U1*	3.725 *A1,W8* 4.725 *N4*	5.35 *A1*		
	Cleveland, Ohio				$70.50 *R3*							5.10 *A5,J3*		7.45 *J3*
	Detroit, Mich.	$56.00 *R5*	$57.00 *R5*		$73.50 *R5*	$79.00 *R5*					4.025 *G3* 4.40 *M2*	5.30 *G3* 5.45 *M2* 5.60 *D1* 6.05 *D2*	6.30 *G3*	8.15 *G3*
	Duluth, Minn.													
	Gary, Ind. Harbor, Indiana			$59.00 *U1*	$70.50 *U1*	$76.00 *U1, Y1*		4.675 *I3*	3.85 *I3, U1*	5.80 *I3, U1* 6.30 *Y1*	3.725 *I3, U1, Y1*	5.35 *I3*	5.65 *I3, U1* 6.15 *Y1*	
	Granite City, Ill.													
	Kokomo, Ind.													
	Middletown, Ohio											5.10 *A7*		
	Niles, Ohio Sharon, Pa.										4.225 *S1*	5.70 *T4* 5.80 *S1*	5.65 *S1*	7.30 *S1*
	Pittsburgh, Pa.	$54.00 *U1*	$57.00 *U1*	$59.00 *U1, J3*	$70.50 *U1, J3*	$76.00 *U1*	3.55 *U1* 3.65 *J3*	4.675 *U1*	3.85 *U1,J3*	5.80 *U1,J3*	3.725 *J3,A7* 3.975 *A3* 4.225 *S7,S9*	5.10 *J3,A7* 5.45 *A3* 5.80 *B4,S7*		
	Portsmouth, Ohio													
	Weirton, Wheeling, Follansbee, W. Va.								4.10 *W3*		3.825 *W3*	5.10 *W3*	6.10 *W3*	7.95 *W3*
	Youngstown, Ohio					$76.00 *Y1, C10*	3.55 *U1, R3*			6.30 *Y1*	3.725 *U1, Y1,R3*	5.10 *R3, Y1* 5.70 *C5* 5.80 *B4*	5.65 *R3, U1* 6.15 *Y1*	7.30 *R3* 7.80 *Y1*
WEST	Fontana, Cal.	$81.00 *K1*	$83.00 *K1*	$78.00 *K1*	$89.50 *K1*	$95.00 *K1*			4.45 *K1*	6.40 *K1*	4.975 *K1*	6.75 *K1*	6.55 *K1*	
	Geneva, Utah				$70.50 *C7*				3.85 *C7*	5.80 *C7*				
	Kansas City, Mo.								4.45 *S2*		4.325 *S2*			
	Los Angeles, Torrance, Cal.				$89.50 *B2*	$96.00 *B2*			4.45 *C7,B2*	6.35 *B2*	4.475 *C7,B2*	6.85 *C1*	6.40 *B2*	
	Minnequa, Colo.								4.30 *C6*		4.775 *C6*			
	San Francisco, Niles, Pittsburg, Cal.				$89.50 *B2*				4.40 *B2* 4.56 *P9*	6.30 *B2*	4.475 *C7,B2*		6.40 *B2*	
	Seattle, Wash.				$89.50 *B2*				4.50 *B2*	6.40 *B2*	4.725 *B2*		6.85 *B2*	
SOUTH	Atlanta, Ga.										4.275 *A8*			
	Birmingham, Ala. Alabama City, Ala.			$59.00 *T2*	$70.50 *T2*				3.85 *T2,R3*	5.80 *T2*	3.725 *T2,R3*			
	Houston, Texas		$65.00 *S2*		$78.50 *S2*	$84.00 *S2*			4.25 *S2*		4.125 *S2*			

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

IRON AGE

STEEL PRICES

SHEETS									WIRE ROD	TINPLATE†		BLACK PLATE	
Hot-rolled *18* ga. & hvyr.	Cold-rolled	Galvanized *10* ga.	Enameling *12* ga.	Long Terne *10* ga.	Hi Str. Low Alloy H.R.	Hi Str. Low Alloy C.R.	Hi Str. Low Alloy Galv.	Hot-rolled *19* ga.		Cokes* *1.25*-lb. base box	Electro* *0.25*-lb. base box	Hollowware Enameling *29* ga.	
										† Special coated mfg ternes deduct 95¢ from 1.25-lb coke base box price. Can-making quality blackplate 55 to 128 lb deduct $2.20 from 1.25-lb coke base box. * COKES: 1.50-lb add 25¢. ELECTRO: 0.50-lb add 25¢; 0.75-lb add 65¢.			Bethlehem, Pa.
3.775 *B3*	4.575 *B3*				5.675 *B3*	6.925 *B3*							Buffalo, N. Y.
													Claymont, Del.
													Coatesville, Pa.
4.175 *A2*					5.925 *A2*								Conshohocken, Pa.
													Harrisburg, Pa.
													Hartford, Conn.
									4.325 *B3*				Johnstown, Pa.
													Newark, N. J.
													New Haven, Conn.
													Phoenixville, Pa.
													Putnam, Conn.
3.775 *B3*	4.575 *B3*	5.075 *B3*			5.675 *B3*	6.925 *B3*	7.775 *B3*		4.425 *B3*	$8.80 *B3*	$7.50 *B3*		Sparrows Pt., Md.
									4.625 *A5*				Worcester, Mass.
									4.425 *R4*				Trenton, N. J.
									4.70 *L1*				Alton, Ill.
3.775 *A7*		5.075 *A7*	4.925 *A7*										Ashland, Ky.
		5.075 *R3*											Canton-Massillon, Ohio
3.775 *W8*					5.675 *U1*				4.325 *A5, N4, R3*				Chicago, Sterling, Ill.
3.775 *R3, J3*	4.575 *R3, J3*		4.925 *R3*		5.675 *R3, J3*	6.925 *R3, J3*			4.325 *A5*				Cleveland, Ohio
3.975 *G3*	4.775 *G3*				6.225 *G3*	7.475 *G3*							Detroit, Mich.
													Duluth, Minn.
3.775 *I3, U1, Y1*	4.575 *I3, U1, Y1*	5.075 *I3, U1*	4.925 *U1*	5.475 *U1*	5.675 *I3, U1* 6.175 *Y1*	6.925 *I3, U1* 7.425 *Y1*			4.325 *Y1*	$8.70 *U1, I3, Y1*	$7.40 *U1, I3*	6.10 *U1, Y1*	Gary Ind. Harbor, Indiana
4.30 *G2*	5.275 *G2*	5.50 *G2*	5.625 *G2*								$7.60 *G2*	6.30 *G2*	Granite City, Ill.
		5.475 *C9*											Kokomo, Ind.
	4.575 *A7*		4.925 *A7*	5.475 *A7*									Middletown, Ohio
4.175 *S1*					5.675 *S1*						$7.40 *R3*		Niles, Ohio Sharon, Pa.
3.775 *U1, J3, A7* 3.925 *A3*	4.575 *U1, J3, A7*	5.075 *U1*	4.925 *U1*		5.675 *U1, J3*	6.925 *U1, J3*	7.625 *U1*		4.325 *A5* 4.525 *P6*	$8.70 *U1, J3*	$7.40 *U1, J3*	6.10 *U1*	Pittsburgh, Pa.
									4.525 *P7*				Portsmouth, Ohio
3.775 *W3, W5*	4.575 *W3, W5*	5.075 *W3, W5*		5.475 *W3, W5*	6.025 *W3*	7.275 *W3*				$8.70 *W3, W5*	$7.40 *W3, W5*	6.35 *W5*	Weirton Wheeling, Follansbee, W. Va.
3.775 *U1, R3, Y1*	4.575 *R3, Y1*	5.775 *R1*	4.925 *Y1*	6.05 *E2*	5.675 *R3, U1* 6.175 *Y1*	6.925 *R3* 7.425 *Y1*		5.65 *E2* 5.825 *R1*	4.325 *Y1*	$8.70 *R3*			Youngstown, Ohio
4.725 *K1*	5.525 *K1*				6.625 *K1*	7.875 *K1*			5.125 *K1*				Fontana, Cal.
3.875 *C7*													Geneva, Utah
													Kansas City, Mo.
4.475 *C7*		5.825 *C7*						5.575 *C7*	5.125 *C7, B2*				Los Angeles, Torrance, Cal.
									4.575 *C6*				Minnequa, Colo.
4.475 *C7*	5.525 *C7*	5.825 *C7*							4.975 *C7*	$9.45 *C7*	$8.15 *C7*		San Francisco, Niles, Pittsburg, Cal.
													Seattle, Wash.
													Atlanta, Ga.
3.775 *T2, R3*	4.575 *T2*	5.075 *T2, R3*			5.675 *T2*			4.925 *R3*	4.325 *T2, R3*	$8.80 *T2*	$7.50 *T2*		Birmingham, Ala. Alabama City, Ala.
									4.725 *S2*				Houston, Tex.

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BARS						PLATES				WIRE
		Carbon Steel	Reinforcing	Cold Finished	Alloy Hot-rolled	Alloy Cold Drawn	Hi Str. H.R. Low Alloy	Carbon Steel	Floor Plate	Alloy	Hi Str. Low Alloy	Mfgr's. Bright
EAST	Bethlehem Pa.				4.675 *B3*	6.00 *B3*	5.925 *B3*					
	Buffalo N. Y.	3.95 *B3,R3*	3.95 *B3,R3*	4.975 *B5*	4.675 *B3,R3*	6.00 *B3,B5*	5.925 *B3*	3.90 *B3*			5.95 *B3*	
	Claymont Del.							4.35 *C4*		5.35 *C4*		
	Coatesville Pa.							4.35 *L4*		5.75 *L4*		
	Conshohocken Pa.							4.35 *A2*	4.95 *A2*		6.20 *A2*	
	Harrisburg Pa.							6.50 *C3*	6.50 *C3*			
	Hartford Conn.			5.475 *R3*		6.45 *R3*						
	Johnstown Pa.	3.95 *B3*	3.95 *B3*		4.675 *B3*		5.925 *B3*	3.90 *B3*		5.25 *B3*	5.95 *B3*	5.225 *B3*
	Newark N. J.			5.375 *W10*		6.35 *W10*						
	New Haven Conn.											
	Phoenixville Pa.											
	Putnam Conn.			5.475 *W10*								
	Sparrows Pt. Md.		3.95 *B3*					3.90 *B3*		5.25 *B3*	5.95 *B3*	5.325 *B3*
	Worcester Mass.					6.35 *A5*						5.525 *A5*
	Trenton N. J.											
MIDDLE WEST	Alton Ill.	4.50 *L1*										5.45 *L1*
	Ashland Ky.							3.90 *A7*				
	Canton-Massillon	3.95 *R3*		4.925 *R2,R3*	4.675 *R3* 4.72 *T5*	5.99 *T5* 6.00 *R2,R3*						
	Chicago Sterling Ill.	3.95 *U,W8, R3,* 4.55 *N4*	3.95 *R3* 4.70 *N4*	4.925 *A5,B5, W8,W10*	4.675 *R3 U1, W8*	6.00 *B5,L2, R3,W8,W10* 6.05 *A5*		3.90 *U1, W8*	4.95 *U1*	5.25 *U1*	5.95 *U1*	5.225 *A3, N4,R3* 5.325 *K2* 5.475 *W7*
	Cleveland Ohio	3.95 *R3*	3.95 *R3*	4.925 *A5,C13*		6.00 *C13* 6.05 *A5*	5.925 *R3*	3.90 *R3,J3*	4.95 *J3*		5.95 *R3,J3*	5.225 *A5, C13,R3*
	Detroit Mich.	4.10 *R5* 4.30 *G3*		5.075 *R5,P8* 5.175 *P3*	4.825 *R5* 5.025 *G3*	6.15 *R5,P8* 6.20 *P3*	6.675 *G3*	4.45 *G3*			6.90 *G3*	
	Duluth Minn.											5.252 *A5*
	Gary Ind. Harbor Indiana	3.95 *I3, U1, Y1*	3.95 *I3, U1, Y1*	4.925 *L2, M5,R3*	4.675 *I3, U1, Y1*	6.90 *L2,M5, R3,R5*	5.925 *I3, U1,* 6.425 *Y1*	3.90 *I3, U1, Y1*	4.95 *I3*	5.25 *U1*	5.95 *I3, U1* 6.45 *Y1*	5.325 *M4*
	Granite City Ill.							4.60 *G2*				
	Kokomo Ind.											5.325 *C9*
	Middletown Ohio											
	Niles Ohio Sharon Pa.							4.15 *S1*		5.70 *S1*	5.95 *S1*	
	Pittsburgh Pa.	3.95 *U1, J3*	3.95 *U1, J3*	4.925 *A5, J3, W10,R3,C8*	4.675 *U1, J3*	6.00 *W10,C8* 6.05 *A5*	5.925 *U1, J3*	3.90 *U1, J3*	4.95 *U1, J3*	5.25 *U1, J3*	5.95 *U1, J3*	5.225 *A5, J3* 5.475 *P6*
	Portsmouth Ohio											5.625 *P7*
	Weirton Wheeling Follansbee W. Va.	4.10 *W3*						3.90 *W5* 4.20 *W3*				
	Youngstown Ohio	3.95 *U1, Y1, R3*	3.95 *U1, Y1, R3*	4.925 *Y1*	4.675 *U1,C10, Y1*	6.00 *C10, Y1*	5.925 *U1* 6.425 *Y1*	3.90 *U1, Y1, R3*			5.95 *R3* 6.45 *Y1*	5.225 *Y1*
WEST	Fontana Cal.	4.65 *K1*	4.65 *K1*		5.725 *K1*		6.975 *K1*	4.50 *K1*		6.20 *K1*	6.55 *K1*	
	Geneva Utah							3.90 *C7*			5.95 *C7*	
	Kansas City Mo.	4.55 *S2*	4.55 *S2*		5.275 *S2*							5.825 *S1*
	Los Angeles Torrance Cal.	4.65 *C7,B2*	4.65 *C7,B2*	6.375 *R3*	5.725 *B2*		6.625 *B2*					6.175 *C7,B1*
	Minnequa Colo.	4.40 *C6*	4.75 *C6*					4.70 *C6*				5.475 *C6*
	San Francisco Niles Pittsburg Cal.	4.65 *C7,P9* 4.70 *B2*	4.65 *C7,P9* 4.70 *B2*				6.675 *B2*					6.175 *C6,C7*
	Seattle Wash.	4.70 *B2*	4.70 *B2*				6.675 *B2*	4.80 *B2*			6.85 *B2*	
SOUTH	Atlanta Ga.	4.50 *A8*	4.50 *A8*									5.475 *A8*
	Birmingham Ala. Alamama City Ala.	3.95 *T2,R3*	3.95 *T2,R3*				5.925 *T2*	3.90 *T2,R3*			5.95 *T2*	5.225 *T2, R3*
	Houston Tex.	4.35 *S2*	4.35 *S2*		5.075 *S2*			4.30 *S2*				5.625 *S2*

Key to Steel Producers

With Principal Offices

A1 Acme Steel Co., Chicago
A2 Alan Wood Steel Co., Conshohocken, Pa.
A3 Allegheny Ludlum Steel Corp., Pittsburgh
A4 American Cladmetals Co., Carnegie, Pa.
A5 American Steel & Wire Div., Cleveland
A6 Angell Nail & Chaplet Co., Cleveland
A7 Armco Steel Corp., Middletown, O.
A8 Atlantic Steel Co., Atlanta, Ga.

B1 Babcock & Wilcox Tube Co., Beaver Falls, Pa.
B2 Bethlehem Pacific Coast Steel Corp., San Francisco
B3 Bethlehem Steel Co., Bethlehem, Pa.
B4 Blair Strip Steel Co., New Castle, Pa.
B5 Bliss & Laughlin Inc., Harvey, Ill.

C1 Calstrip Steel Corp., Los Angeles
C2 Carpenter Steel Co., Reading, Pa.
C3 Central Iron & Steel Co., Harrisburg, Pa.
C4 Claymont Products Dept., Claymont, Del.
C5 Cold Metal Products Co., Youngstown
C6 Colorado Fuel & Iron Corp., Denver
C7 Columbia-Geneva Steel Div., San Francisco
C8 Columbia Steel & Shafting Co., Pittsburgh
C9 Continental Steel Corp., Kokomo, Ind.
C10 Copperweld Steel Co., Glassport, Pa.
C11 Crucible Steel Co. of America, New York
C12 Cumberland Steel Co., Cumberland, Md.
C13 Cuyahoga Steel & Wire Co., Cleveland

D1 Detroit Steel Corp., Detroit
D2 Detroit Tube & Steel Div., Detroit
D3 Driver Harris Co., Harrison, N. J.

E1 Eastern Stainless Steel Corp., Baltimore
E2 Empire Steel Co., Mansfield, O.

F1 Firth Sterling Inc., McKeesport, Pa.
F2 Fitzsimmons Steel Corp., Youngstown
F3 Follansbee Steel Corp., Follansbee, W. Va.

G1 Globe Iron Co., Jackson, O.
G2 Granite City Steel Co., Granite City, Ill.
G3 Great Lakes Steel Corp., Detroit

H1 Hanna Furnace Corp., Detroit

I2 Ingersoll Steel Div., Chicago
I3 Inland Steel Co., Chicago
I4 Interlake Iron Corp., Cleveland

J1 Jackson Iron & Steel Co., Jackson, O.
J2 Jessop Steel Corp., Washington, Pa.
J3 Jones & Laughlin Steel Corp., Pittsburgh
J4 Joslyn Mfg. & Supply Co., Chicago

K1 Kaiser Steel Corp., Fontana, Cal.
K2 Keystone Steel & Wire Co., Peoria
K3 Koppers Co., Granite City, Ill.

L1 Laclede Steel Co., St. Louis
L2 La Salle Steel Co., Chicago
L3 Lone Star Steel Co., Dallas
L4 Lukens Steel Co., Coatesville, Pa.

M1 Mahoning Valley Steel Co., Niles, O.
M2 McLouth Steel Corp., Detroit
M3 Mercer Tube & Mfg. Co., Sharon, Pa.
M4 Mid-States Steel & Wire Co., Crawfordsville, Ind.
M5 Monarch Steel Co., Inc., Hammond, Ind.
M6 Mystic Iron Works, Everett, Mass.

N1 National Supply Co., Pittsburgh
N2 National Tube Co., Pittsburgh
N3 Niles Rolling Mills Co., Niles, O.
N4 Northwestern Steel & Wire Co., Sterling, Ill.

O1 Oliver Iron & Steel Co., Pittsburgh

P1 Page Steel & Wire Div., Monessen, Pa.
P2 Phoenix Iron & Steel Co., Phoenixville, Pa.
P3 Pilgrim Drawn Steel Div., Plymouth, Mich.
P4 Pittsburgh Coke & Chemical Co., Pittsburgh
P5 Pittsburgh Screw & Bolt Co., Pittsburgh
P6 Pittsburgh Steel Co., Pittsburgh
P7 Portsmouth Div., Detroit Steel Corp., Detroit
P8 Plymouth Steel Co., Detroit
P9 Pacific States Steel Co., Niles, Cal.

R1 Reeves Steel & Mfg. Co., Dover, O.
R2 Reliance Div. Eaton Mfg. Co., Massillon, O.
R3 Republic Steel Corp., Cleveland
R4 Roebling Sons Co. (John A.), Trenton, N. J.
R5 Rotary Electric Steel Co., Detroit

S1 Sharon Steel Corp., Sharon, Pa.
S2 Sheffield Steel Corp., Kansas City
S3 Shenango Furnace Co., Pittsburgh
S4 Simonds Saw & Steel Co., Fitchburg, Mass.
S5 Sloss Sheffield Steel & Iron Co., Birmingham
S6 Standard Forging Corp., Chicago
S7 Stanley Works, New Britain, Conn.
S8 Superior Drawn Steel Co., Monaca, Pa.
S9 Superior Steel Corp., Carnegie, Pa.
S10 Sweet's Steel Co., Williamsport, Pa.
S11 Seidelhuber Steel Rolling Mills, Seattle

T1 Tonawanda Iron Div., N. Tonawanda, N. Y.
T2 Tennessee Coal & Iron Div., Birmingham
T3 Tennessee Products & Chem. Corp., Nashville
T4 Thomas Strip Div., Warren, O.
T5 Timken Steel & Tube Div., Canton, O.
T6 Tremont Nail Co., Wareham, Mass.

U1 United States Steel Co., Pittsburgh
U2 Universal-Cyclops Steel Corp., Bridgeville, Pa.

W1 Wallingford Steel Co., Wallingford, Conn.
W2 Washington Steel Corp., Washington, Pa.
W3 Weirton Steel Co., Weirton, W. Va.
W4 Wheatland Tube Co., Wheatland, Pa.
W5 Wheeling Steel Corp., Wheeling, W. Va.
W6 Wickwire Spencer Steel Div., Buffalo
W7 Wilson Steel & Wire Co., Chicago
W8 Wisconsin Steel Co., S. Chicago, Ill.
W9 Woodward Iron Co., Woodward, Ala.
W10 Wyckoff Steel Co., Pittsburgh

Y1 Youngstown Sheet & Tube Co., Youngstown

MERCHANT WIRE PRODUCTS

F o b Mill	Standard & Coated Nails	Woven Wire Fence 9–15½ ga.	Fence Posts	Single Loop Bale Ties	Twisted Barbless Wire	Galv. Barbed Wire	Merch. Wire Ann'ld ¢/lb	Merch. Wire Galv. ¢/lb‡
	Col	Col	Col	Col	Col	Col		
Alabama City *R3*††	118	135	...	132	...	144	6.075	6.325
Aliquippa Pa *J3*	127	141	...	...	...	148	6.075	6.525
Atlanta *A8*	130	140	...	135	...	149	6.325	6.675
Bartonville *K2*	127	139	140	132	143	148	6.075	6.50
Buffalo *W6*	...	...	...	...	...	...	...	...
Chicago *N4*††	118	137	...	132	146	146	6.075	6.40
Cleveland *A6*	...	...	...	...	...	...	...	...
Cleveland *A5*	...	...	...	...	...	...	6.075	6.225
Crawfrdsvl *M4*	130	140	...	134	...	149	6.175	6.55
Donora Pa *A5*††	118	133	...	132	...	142	6.075	6.225
Duluth *A5*††	118	133	...	132	...	142	6.075	6.225
Fairfield Ala *T2*††	118	133	...	132	...	142	6.075	6.225
Houston *S2*	135	147	...	...	...	156	6.475	6.925
Johnstn Pa *B3*	127	...	148	...	149	...	...	6.575
Joliet Ill *A5*††	118	133	...	132	...	142	6.075	6.225
Kokomo Ind *C9*	...	...	142	...	...	...	6.175	6.425
Los Angeles *B2*	...	...	...	...	...	...	7.025	...
Kansas City *S2*	139	...	...	144	...	160	6.675	7.125
Minnequa *C6*††	123	146	138	137	...	153	6.325	6.70
Monessen *P6*	...	...	...	...	...	...	...	...
Moline Ill *R3*	...	...	136	...	...	...	...	...
Pittsburg Cal *C7*††	137	156	...	156	162	162	7.025	7.125
Monessen *P6*	127	138	...	...	147	147	6.075	6.45
Portsmouth *P7*	132	...	...	...	...	...	6.47	...
Rankin Pa *A5*††	118	133	...	...	...	142	6.075	6.225
So Chicago *R3*††	118	135	140	132	...	144	6.075	6.325
S San Fran *C6*	...	...	...	156	...	167	7.025	7.40
Sparrows Pt *B3*	129	...	...	134	151	...	...	6.675
Struthers O *Y1*‡	...	...	...	...	...	...	6.075	6.475
Torrance Cal *C7*††	138	...	...	...	...	...	7.025	...
Worcester *A5*††	124	...	...	...	...	...	6.375	6.525
Williamsport Pa *S10*	...	...	...	...	...	...	...	...

Cut Nails carloads base $7.80 per 100 lb. (less 20¢ to jobbers) at Conshohocken Pa. (*A2*) Wheeling W. Va. (*W5*) $7.80.

†† Add 45¢ per 100 lb. on Std. & Coated Nails.

† Zinc extra if not included on Galv Merch Wire.

‡ Galv. Merch. Wire based on 15¢ Zinc.

STAINLESS STEELS

Base price, cents per lb, f.o.b. mill. Ads 4.7 pct

Product	301	302	303	304	316	321	347	410	416	430
Ingots, rerolling	14.25	15.25	16.75	16.25	24.75	20.00	21.75	12.75	14.75	13.00
Slabs, billets, rerolling	18.50	20.00	22.00	21.00	32.25	26.25	28.50	16.50	20.00	16.75
Forg. discs, die blocks, rings	34.00	34.25	36.75	35.75	53.00	40.25	44.75	28.00	28.50	28.50
Billets, forging	26.25	26.50	28.50	27.75	41.50	31.25	35.00	21.50	22.00	22.00
Bars, wires, structurals	31.25	31.50	34.00	33.00	49.25	37.00	41.50	25.75	26.25	26.25
Plates	33.00	33.25	35.25	35.25	52.00	40.75	45.25	27.00	27.50	27.50
Sheets	41.00	41.25	43.25	43.25	57.00	49.25	53.75	36.50	37.00	39.00
Strip, hot-rolled	26.50	28.25	32.50	30.25	48.75	37.00	41.25	23.50	30.25	24.00
Strip, cold-rolled	34.00	36.75	40.25	38.75	59.00	48.25	52.25	30.50	37.00	31.00

STAINLESS STEEL PRODUCING POINTS—*Sheets.* Midland, Pa., *C11* Brackenridge, Pa., *A3* Butler, Pa., *A7* McKeesport, Pa., *U1* Washington, Pa., *W2* (type 316 add 4.5¢) *J3* Baltimore, *E1* Middletown, O., *A7* Massillon, O., *R3* Gary, *U1* Bridgeville, Pa., *U2* New Castle, Ind., *I2* Ft. Wayne, *J4* Lockport, N. Y., *R4.*

Strip. Midland, Pa., *C11* Cleveland, *A5* Carnegie, Pa., *S9* McKeesport, Pa., *F1* Reading, Pa., *C2* Washington, Pa., *W2* (type 316 add 4.5¢); W. Leechburg, Pa., *A3* Bridgeville, Pa., *U2* Detroit, *M2* Canton-Massillon, O., *R3* Middletown, O., *A7* Harrison, N. J., *D3* Youngstown, *C5* Lockport, N. Y., *S4* Sharon, Pa., *S1* (type 301 add ¾¢); Butler, Pa., *A7* Wallingford, Conn., *W1.*

Bars. Baltimore, *A7* Duquesne, Pa., *U1* Munhall, Pa., *U1* Reading, Pa., *C2* Titusville, Pa., *U2* Washington, Pa., *J2* McKeesport, Pa., *U1, F1* Bridgeville, Pa., *U2* Dunkirk, N. Y., *A3* Massillon, O., *R3* Chicago, *U1* Syracuse, N. Y., *C11* Watervliet, N. Y., *A3* Waukegan, *A5* Lockport, N. Y., *S4* Canton, O., *T5* Ft. Wayne, *J4.*

Wires. Waukegan, *A5* Massillon, O., *R3* McKeesport, Pa., *F1* Ft. Wayne, *J4* Harrison, N. J., *D3* Baltimore, *A7* Dunkirk, *A3* Monessen, *P1* Syracuse, *C11* Bridgeville, *U2.*

Structurals. Baltimore, *A7* Massillon, O., *R3* Chicago, Ill., *J4* Watervliet, N. Y., *A3* Syracuse, *C11.*

Plates Brackenridge Pa., *A3* (type 416 add ¾¢); Butler, Pa., *A7* Chicago, *U1* Munhall, Pa., *U1* Midland, Pa., *C11* New Castle, Ind., *I2* Lockport, N. Y., *S4* Middletown, *A7* Washington, Pa., *J2* Cleveland, Massillon, *R3.*

Forged discs, die blocks, rings. Pittsburgh, *C11* Syracuse, *C11* Ferndale, Mich., *A3* Washington, Pa., *J2.*

Forging billets. Midland, Pa., *C11* Baltimore, *A7* Washington, Pa., *J2* McKeesport, *F1* Massillon, Canton, O., *R3* Watervliet, *A3* Pittsburgh, Chicago, *U1*; Syracuse, *C11.*

ALLEGHENY LUDLUM—Slightly higher on Type 301; slightly lower on others in 300 series.

WASHINGTON STEEL—Slightly lower on 300 series except where noted.

PIPE AND TUBING

Base discounts f.o.b. mills. Base price about $200 per net ton.

	BUTTWELD														SEAMLESS					
	½ In.		¾ In.		1 In.		1¼ In.		1½ In.		2 In.		2½-2 In.		2 In.		2½-3 In.		3½-4 In.	
	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.
STANDARD T. & C.																				
Sparrows Pt. *B3*	30.5	8.25	33.5	12.25	35.5	15.75	36.5	16.25	37.0	17.25	37.5	17.75	38.0	18.25	.....	.....	.....	.....	.....	.....
Youngstown *R3*	32.5	10.25	35.5	14.25	38.0	17.75	38.5	18.25	39.0	19.25	39.5	19.75	40.0	20.25	.....	.....	.....	.....	.....	.....
Fontana *K1*	21.0	+1.25	24.0	2.75	26.5	6.25	27.0	6.75	27.5	7.75	28.0	8.25	28.5	8.75	.....	.....	.....	.....	.....	.....
Pittsburgh *J3*	32.5	10.25	35.5	13.25	38.0	15.75	38.5	16.75	39.0	17.25	39.5	17.75	40.0	18.75	24.0	2.25	27.0	5.75	29.0	7.75
Alton, Ill. *L1*	31.5	9.25	34.5	13.25	37.0	16.75	37.5	17.25	38.0	18.25	38.5	18.75	39.0	19.25	.....	.....	.....	.....	.....	.....
Sharon *M3*	32.5	9.25	35.5	13.25	38.0	16.25	38.5	16.75	39.0	17.25	39.5	17.75	40.0	18.25	.....	.....	.....	.....	.....	.....
Pittsburgh *N1*	32.5	10.25	35.5	14.25	38.0	17.75	38.5	18.25	39.0	19.25	39.5	19.75	40.0	20.25	24.0	.....	27.0	.....	29.0	.....
Wheeling *W5*	32.5	10.25	35.5	14.25	38.0	17.75	38.5	18.25	39.0	19.25	39.5	19.75	40.0	20.25	.....	.....	.....	.....	.....	.....
Wheatland *W4*	32.5	10.25	35.5	13.25	38.0	15.75	38.5	16.75	39.0	17.25	39.5	17.75	40.0	18.75	.....	.....	.....	.....	.....	.....
Youngstown *Y1*	32.5	10.25	35.5	14.25	38.0	17.75	38.5	18.25	39.0	19.25	39.5	19.75	40.0	20.25	24.0	3.75	27.0	6.75	29.0	8.75
Indiana Harbor *Y1*	31.5	9.25	34.5	13.25	37.0	16.75	37.5	17.25	38.0	18.25	38.5	18.75	39.0	19.25	.....	.....	.....	.....	.....	.....
Lorain *N2*	32.5	15.25	35.5	14.25	38.0	17.75	38.5	18.25	39.0	19.25	39.5	19.75	40.0	20.25	24.0	3.75	27.0	6.75	29.0	8.75
EXTRA STRONG PLAIN ENDS																				
Sparrows Pt. *B3*	30.25	9.5	34.25	13.5	36.25	17.0	36.75	17.5	37.25	18.5	37.75	19.0	38.25	19.5	.....	.....	.....	.....	.....	.....
Youngstown *R3*	32.25	11.5	36.25	15.5	38.25	19.0	38.75	19.5	39.25	20.5	39.75	21.0	40.25	21.5	.....	.....	.....	.....	.....	.....
Fontana *K1*	20.75	.....	24.75	.....	26.75	.....	27.25	.....	27.75	.....	28.25	.....	28.75	.....	.....	.....	.....	.....	.....	.....
Pittsburgh *J3*	32.25	10.0	36.25	14.0	38.25	16.0	38.75	17.0	39.25	17.5	39.75	18.0	40.25	19.0	23.75	2.0	27.75	6.5	31.25	10.0
Alton, Ill. *L1*	29.25	8.5	33.25	12.5	35.25	16.0	35.75	16.5	36.25	17.5	36.75	18.0	37.25	18.5	.....	.....	.....	.....	.....	.....
Sharon *M3*	32.25	10.5	36.25	14.5	38.25	17.5	38.75	18.0	39.25	18.5	39.75	19.0	40.25	19.5	.....	.....	.....	.....	.....	.....
Pittsburgh *N1*	32.25	11.5	36.25	15.5	38.25	19.0	38.75	19.5	39.25	20.5	39.75	21.0	40.25	21.5	23.75	.....	27.75	.....	31.25	.....
Wheeling *W5*	32.25	11.5	36.25	15.5	38.25	19.0	38.75	19.5	39.25	20.5	39.75	21.0	40.25	21.5	.....	.....	.....	.....	.....	.....
Wheatland *W4*	32.25	10.0	36.25	14.0	38.25	16.0	38.75	17.0	39.25	17.5	39.75	18.0	40.25	19.0	.....	.....	.....	.....	.....	.....
Youngstown *Y1*	32.25	11.5	36.25	15.5	37.75	19.0	38.75	19.5	39.25	20.5	39.75	21.0	40.25	22.5	23.75	4.5	27.75	8.5	31.25	12.0
Indiana Harbor *Y1*	31.25	10.5	35.25	14.5	37.25	17.5	37.75	18.5	38.25	19.5	38.75	20.0	39.25	20.5	.....	.....	.....	.....	.....	.....
Lorain *N2*	32.25	11.5	36.25	15.5	38.25	19.0	38.75	19.5	39.25	20.5	39.75	21.0	40.25	21.5	23.75	4.5	27.75	8.5	31.25	12.0

Galvanized discounts based on zinc, at 17¢ per lb, East St. Louis. For each 1¢ change in zinc, discounts vary as follows: ½ in., ¾ in., and 1 in., 1 pt.; 1¼ in., 1½ in., 2 in., ¾ pt.. 2½ in., 3 in., ½ pt. Calculate discounts on even cents per lb of zinc, i.e., if zinc is 16.51¢ to 17.50¢ per lb, use 17¢. Jones & Laughlin discounts apply only when zinc price changes 1¢; Threads only buttweld and seamless, 1 pt. higher discount. Plain ends, buttweld and seamless, 3 in. and under, 3¾ pts. higher discount. Buttweld jobbers' discount, 5 pct. St. Louis zinc price now 12.5¢.

COKE

	Net-Ton
Furnace, beehive (f.o.b. oven)	
Connellsville, Pa.	$14.50 to $15.00
Foundry, beehive (f.o.b. oven)	
Connellsville, Pa.	$17.50 to $18.00
Foundry, oven coke	
Buffalo, del'd	$26.58
Chicago, f.o.b.	23.00
Detroit, f.o.b.	24.00
New England, del'd	24.80
Seaboard, N. J., f.o.b.	22.75
Philadelphia, f.o.b.	22.70
Swedeland, Pa., f.o.b.	22.60
Painesville, Ohio, f.o.b.	24.00
Erie, Pa., f.o.b.	23.50
Cleveland, del'd	25.72
Cincinnati, del'd	25.06
St. Paul, f.o.b.	22.50
St. Louis	25.40
Birmingham, del'd	21.69
Neville Island	23.00
Lone Star, Tex., f.o.b.	18.50

ELECTRICAL SHEETS

22 Ga. H-R cut length F.o.b. Mill Cents Per Lb.	Armature	Elec.	Motor	Dynamo	Transf. 72	Transf. 65	Transf. 58
Beech Bottom *W5*	....	7.85	9.10	9.90	10.45	11.00	11.70
Brackenridge *A3*	7.35	7.85	9.10	9.90	10.45	11.00	11.70
Granite City *G2*	....	8.55	9.80	....	....	....	....
Ind. Harbor *I3*	7.35	7.85	9.10	....	....	....	....
Mansfield *E2*	7.35	7.85	9.10	9.90	....	....	....
Niles, O. *N3*	7.35	7.85	....	....	....	....	....
Vandergrift *U1*	7.35	7.85	9.10	9.90	10.45	11.00	11.70
Warren, O. *R3*	7.35	7.85	9.10	....	....	....	....
Zanesville *A7*	7.35	7.85	9.10	9.90	10.45	11.00	11.70

CAST IRON WATER PIPE

	Per Net Ton
6 to 24-in., del'd Chicago	$105.30 to $108.80
6 to 24-in., del'd N.Y.	108.50 to 109.50
6 to 24-in., Birmingham	91.50 to 96.00
6-in. and larger, f.o.b. cars, San Francisco, Los Angeles, for all rail shipments; rail and water shipments less	$123.00 to $130.00

Class "A" and gas pipe, $5 extra; 4-in. pipe is $5 a ton above 6-in.

BOILER TUBES

$ per 100 ft. carload lots, cut 10 to 24 ft. F.o.b. Mill	Size		Seamless		Elec. Weld	
	OD-In.	B.W. Ga.	H.R.	C.D.	H.R.	C.D.
Babcock & Wilcox	2	13	23.93	28.14	23.19	27.28
	2½	12	32.17	37.83	31.19	36.67
	3	12	35.78	42.11	34.69	40.82
	3½	11	44.72	52.65	43.36	51.05
	4	10	55.52	65.31	53.83	63.32
National Tube	2	13	22.81	27.94	22.23	.....
	2½	12	31.28	38.31	30.51	.....
	3	12	35.87	43.93	34.98	.....
	3½	11	42.56	52.12	.....	.....
	4	10	54.02	66.16	.....	.....
Pittsburgh Steel	2	13	.....	28.58	.....	.....
	2½	12	32.16	39.19	.....	.....
	3	12	36.87	44.93	.....	.....
	3½	11	43.76	53.32	.....	.....
	4	10	.....	67.68	.....	.....

PIG IRON

Dollars per gross ton, f.o.b., subject to switching charges.

Producing Point	Basic	Foundry	Malleable	Bessemer	Low Phos.	Bl. Furnace Silvery	Low Phos. Charcoal
Bethlehem *B3*	56.50	57.00	57.50	58.00	.....	.....	.....
Birmingham *R3*	50.88	51.38	.....	.....	.....	.....	.....
Birmingham *W9*	50.88	51.38	.....	.....	.....	.....	.....
Birmingham *S5*	50.88	51.38	.....	.....	.....	.....	.....
Buffalo *R3*	54.50	55.00	55.50	.....	.....	.....	.....
Buffalo *H1*	54.50	55.00	55.50	.....	.....	66.75	.....
Buffalo *W6*	54.50	55.00	55.50	.....	.....	.....	.....
Chicago *I4*	54.50	55.00	55.00	55.50	.....	.....	.....
Cleveland *A5*	54.50	55.00	55.00	55.50	59.50	.....	.....
Cleveland *R3*	54.50	55.00	55.00	.....	.....	.....	.....
Daingerfield, Tex. *L3*	50.50	51.00	51.00	.....	.....	.....	.....
Duluth *I4*	54.50	55.00	55.00	55.50	.....	.....	.....
Erie *I4*	54.50	55.00	55.00	55.50	.....	.....	.....
Everett, Mass. *M6*	.....	59.25	59.75	.....	.....	.....	.....
Fontana *K1*	60.50	61.00	.....	.....	.....	.....	.....
Geneva, Utah *C7*	54.50	55.00	.....	.....	.....	.....	.....
Granite City, Ill. *K3*	56.40	56.90	57.40	.....	.....	.....	.....
Hubbard, Ohio *Y1*	54.50	55.00	55.00	.....	.....	.....	.....
Jackson, Ohio *J1,G1*	.....	.....	.....	.....	.....	65.50	.....
Lyle, Tenn. *T3*	.....	.....	.....	.....	.....	.....	68.50
Minnequa *C6*	56.50	57.50	57.50	.....	.....	.....	.....
Monessen *P6*	56.50	.....	.....	.....	.....	.....	.....
Neville Island *P4*	54.50	55.00	55.00	55.50	.....	.....	.....
Pittsburgh *U1*	54.50	.....	.....	55.50	.....	.....	.....
Sharpsville *S3*	54.50	55.00	55.00	55.50	.....	.....	.....
Steelton *B3*	56.50	57.00	57.50	58.00	62.50	.....	.....
Swedeland *A2*	58.50	59.00	59.50	60.00	.....	.....	.....
Toledo *I4*	54.50	55.00	55.00	55.50	.....	.....	.....
Troy, N. Y. *R3*	56.50	57.00	57.50	.....	62.50	.....	.....
Youngstown *Y1*	54.50	55.00	55.00	55.50	.....	.....	.....
N. Tonawanda, N. Y. *T1*	.....	55.00	55.50	.....	.....	.....	.....

DIFFERENTIALS: Add 50¢ per ton for each 0.25 pct silicon over base, (1.75 to 2.25 pct, except low phos., 1.75 to 2.00 pct), 50¢ per ton for each 0.50 pct manganese over 1 pct, $2 per ton for 0.5 to 0.75 pct nickel, $1 for each additional 0.25 pct nickel. Subtract 38¢ per ton for phosphorus, content 0.70 pct and over. Silvery Iron: Add $1.50 per ton net for each 0.50 pct silicon over base (6.01 to 6.50 pct) up to 17 pct. $1 per ton for 0.75 pct or more phosphorus, manganese as above. Bessemer ferrosilicon prices are $1 over comparable silvery iron.

C-R SPRING STEEL

Cents Per Lb. F.o.b. Mill	CARBON CONTENT				
	0.26-0.40	0.41-0.60	0.61-0.80	0.81-1.05	1.06-1.35
Bridgeport, Conn.* *S7*	5.80	7.65	8.25	10.20	12.50
Carnegie, Pa. *S9*	.....	7.65	8.25	10.20	12.50
Cleveland *A5*	5.10	7.30	8.25	10.20	12.50
Detroit *D1*	6.45	7.50	8.10	.....	.....
New Castle, Pa. *B4*	5.80	7.65	8.25	10.20	.....
New Haven, Conn. *D1*	6.70	7.60	8.20	.....	.....
Sharon, Pa. *S1*	5.80	7.65	8.25	10.20	12.50
Trenton, N. J. *R4*	.....	7.95	8.55	10.50	12.80
Warren, Ohio *T4*	6.20	7.65	8.25	10.20	12.50
Weirton, W. Va. *W3*	5.80	7.65	8.25	10.20	12.50
Worcester, Mass. *A5*	5.40	7.60	8.55	10.50	12.80
Youngstown *C5*	.....	7.65	8.25	10.20	12.50

*Sold on Pittsburgh base.

RAILS, TRACK SUPPLIES

F.o.b. Mill Cents Per Lb	No. 1 Std. Rails	Light Rails	Joint Bars	Track Spikes	Screw Spikes	Tie Plates	Track Bolts Treated
Bessemer *U1*	3.775	4.25	4.925				
Chicago *R3*				6.65			
Cleveland *R3*							
Ensley *T2*	3.775	4.25					
Fairfield *T2*		4.25		6.65		4.775	
Gary *U1*	3.775	4.25				4.775	
Ind. Harbor *I3*	3.775		4.925	6.65		4.775	
Johnstown *B3*		4.25					
Joliet *U1*		4.25	4.925				
Kansas City *S2*							
Lackawanna *B3*	3.775	4.25	4.925			4.775	
Lebanon *B3*				6.65			
Minnequa *C6*	3.775	4.75	4.925	6.65		4.775	9.85
Pittsburgh *R3*							
Pittsburgh *O1*							
Pittsburgh *P5*				6.65			
Pittsburgh *J3*						4.925	
Pitt'g, Cal. *C7*						4.925	
Seattle *B2*				7.15		4.925	
Steelton *B3*	3.775		4.925			4.775	
Struthers *Y1*				6.65			
Torrance *C7*						4.925	
Youngstown *R3*				6.65			

TOOL STEEL

F.o.b. mill
Add 4.7 pct

W	Cr	V	Mo	Co	Base per lb
18	4	1	—	—	$1.505
18	4	1	—	5	$2.13
18	4	2	—	—	$1.65
1.5	4	1.5	8	—	81.0¢
6	4	2	6	—	96.5¢

High-carbon chromium ..... 63.5¢
Oil hardened manganese ..... 25¢
Special carbon ..... 32.5¢
Extra carbon ..... 27¢
Regular carbon ..... 23¢

Warehouse prices on and east of Mississippi are 3.5¢ per lb. higher. West of Mississippi, 5.5¢ higher.

CLAD STEEL

Add 4.7 pct

Stainless-carbon	Plate	Sheet
No. 304, 20 pct.		
Coatesville, Pa. *L4*	*29.5	
Washington, Pa. *J2*	*29.5	
Claymont, Del. *C4*	*28.00	
Conshohocken, Pa. *A2*		*27.50
New Castle, Ind. *I2*	*29.77	*26.24
Nickel-carbon		
10 pct Coatesville, Pa. *L4*	32.5	
Inconel-carbon		
10 pct Coatesville, Pa. *L4*	40.5	
Monel-carbon		
10 pct Coatesville, Pa. *L4*	33.5	
No. 302 Stainless-copper stainless, Carnegie, Pa. *A4*		77.00
Aluminized steel sheets, hot dip, Butler, Pa. *A7*		7.75

* Includes annealing and pickling, or sandblasting.

ELECTRODES

Cents per lb, f.o.b., plant threaded electrodes with nipples, unboxed

Diam. in in.	Length in in.	Cents Per lb.
	GRAPHITE	
17, 18, 20	60, 72	17.85
8 to 16	48, 60, 72	17.85
7	48, 60	19.57
6	48, 60	20.95
4, 5	40	21.50
3	40	22.61
2½	24, 30	23.15
2	24, 30	25.36
	CARBON	
40	100, 110	8.45
35	65, 110	8.45
30	65, 84, 110	8.45
24	72 to 104	8.45
20	84, 90	8.45
17	60, 72	8.45
14	60, 72	9.02
10, 12	60	9.30
8	60	9.58

FLUORSPAR

Washed gravel, f.o.b. Rosiclaire, Ill. Price, net ton; Effective CaF_2 content:
70% or more $43.00
60% or less 40.00

BOLTS, NUTS, RIVETS, SCREWS

Consumer Prices

(Base, discount, f.o.b. mill, Pittsburgh, Cleveland, Birmingham or Chicago)

Nuts, Hot Pressed, Cold Punched—Sq.

	Pct Off List Less Keg. Reg.	K. Reg.	Less Keg. Hvy.	K. Hvy.
½ in. & smaller.	15	28½	15	28½
9/16 in. & ⅝ in.	12	25	6½	21
¾ in. to 1½ in. inclusive	9	23	1	16½
1⅝ in. & larger.	7½	22	1	16½

Nuts, Hot Pressed—Hexagon

½ in. & smaller.	26	37	22	34
9/16 in. & ⅝ in.	16½	29½	6½	21
¾ in. to 1½ in. inclusive	12	25	2	17½
1⅝ in. & larger.	8⅛	23	2	17½

Nuts, Cold Punched—Hexagon

½ in. & smaller.	26	37	22	34
9/16 in. & ⅝ in.	23	35	17½	30½
¾ in. to 1½ in. inclusive	19½	31½	12	25
1⅝ in. & larger.	8½	23	2	17½

Nuts, Semi-Finished—Hexagon

	Reg.	Hvy.
½ in. & smaller.	35	45	28½	29½
9/16 in. & ⅝ in.	23	35	17½	30½
¾ in. to 1½ in. inclusive	24	36	15	28½
1⅝ in. & larger.	13	26	8½	23
	Light			
7/16 in. & smaller	35	45		
½ in. thru ⅝ in.	28½	39½		
¾ in. to 1½ in. inclusive	26	37		

Stove Bolts *Pct Off List*

Packaged, steel, plain finished 48—10
Packaged, plain finish ..... 31—10
Bulk, plain finish** 62*

*Discounts apply to bulk shipments in not less than 15,000 pieces of a size and kind where length is 3-in. and shorter; 5000 pieces for lengths longer than 3-in. For lesser quantities, packaged price applies.

**Zinc, Parkerized, cadmium or nickel plated finishes add 6¢ per lb net. For black oil finish, add 2¢ per lb net.

Rivets *Base per 100 lb*

½ in. & larger $7.85

Cap and Set Screws

(In bulk)	*Pct Off List*
Hexagon head cap screws, coarse or fine thread, ¼ in. thru ⅝ in. x 6 in., SAE 1020, bright	54
¾ in. thru 1 in. up to & including 6 in.	48
¼ in. thru ⅝ in. x 6 in. & shorter high C double heat treat	46
¾ in. thru 1 in. up to & including 6 in.	41
Milled studs	35
Flat head cap screws, listed sizes....	16
Fillister head cap, listed sizes	34
Set screws, sq head, cup point, 1 in. diam. and smaller x 6 in. & shorter	53

Machine and Carriage Bolts

	Pct Off List Less Case	C.
½ in. & smaller x 6 in. & shorter	15	28½
9/16 in. & ⅝ in. x 6 in. & shorter	18½	30½
¾ in. & larger x 6 in. & shorter	17½	29½
All diam. longer than 6 in...	14	27½
Lag, all diam. x 6 in. & shorter	23	35
Lag, all diam. longer than 6 in.	21	33
Plow bolts	34	....

REFRACTORIES

Fire Clay Brick *Carloads, per 1000*

First quality, Ill., Ky., Md., Mo., Ohio, Pa. (except Salina, Pa., add $5) $94.60
No. 1 Ohio 88.00
Sec. quality, Pa., Md., Ky., Mo., Ill.. 88.00
No. 2 Ohio 79.20
Ground fire clay, net ton, bulk (except Salina, Pa., add $1.50) 13.75

Silica Brick

Mt. Union, Pa., Ensley, Ala. $94.60
Childs, Pa. 99.00
Hays, Pa. 100.10
Chicago District 104.50
Western Utah and Calif. 111.10
Super Duty, Hays, Pa., Athens, Tex., Chicago 111.10
Silica cement, net ton, bulk, Eastern (except Hays, Pa.) 16.50
Silica cement, net ton, bulk, Hays, Pa. 18.70
Silica cement, net ton, bulk, Ensley, Ala. 17.60
Silica cement, net ton, bulk, Chicago District 17.60
Silica cement, net ton, bulk, Utah and Calif. 24.70

Chrome Brick *Per Net Ton*

Standard chemically bonded balt., Chester $82.00

Magnesite Brick

Standard, Baltimore $104.00
Chemically bonded, Baltimore 93.00

Grain Magnesite *St. ¾-in. grains*

Domestic, f.o.b. Baltimore in bulk fines removed $62.70
Domestic, f.o.b. Chewalah, Wash., in bulk 36.30
in sacks 41.80

Dead Burned Dolomite

F.o.b. producing points in Pennsylvania, West Virginia and Ohio per net ton, bulk Midwest, add 10¢; Missouri Valley, add 20¢...$13.75

LAKE SUPERIOR ORES

51.50% Fe; natural content, delivered lower Lake ports. Prices effective July 26, 1952

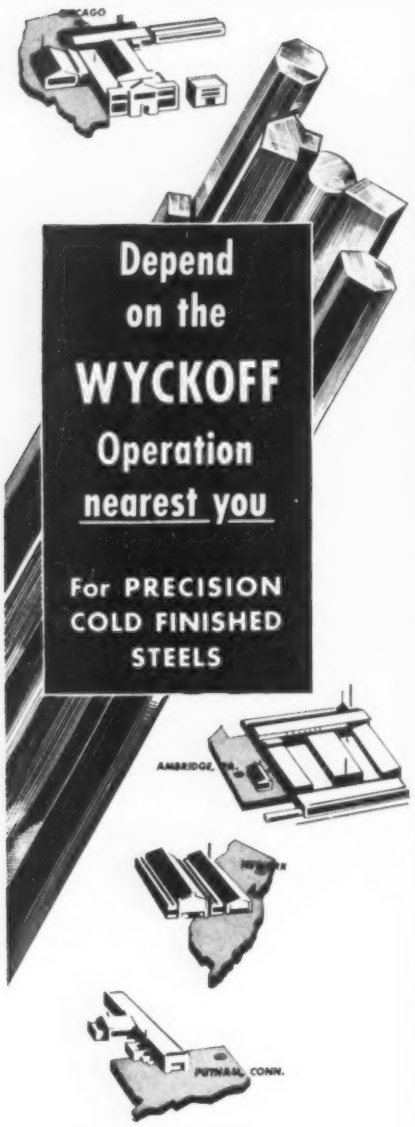
	Gross Ton
Old range, bessemer	$9.45
Old range, nonbessemer	9.30
Mesabi, bessemer	9.20
Mesabi, nonbessemer	9.05
High phosphorus	9.05

After adjustments for analysis, prices will be increased or decreased as the case may be for increases or decreases after Dec. 1, 1950, in Lake vessel rates, upper Lake rail freights, dock handling charges and taxes thereon.

METAL POWDERS

Per pound, f.o.b. shipping point, in ton lots, for minus 100 mesh.

Swedish sponge iron c.i.f. New York, ocean bags... 10.9¢
Canadian sponge iron, del'd. in East ..... 12.0¢
Domestic sponge iron, 98+% Fe, carload lots .....15.5¢ to 17.0¢
Electrolytic iron, annealed, 99.5+% Fe ..... 44.0¢
Electrolytic iron, unannealed, minus 325 mesh, 99+% Fe 60.0¢
Hydrogen reduced iron, minus 300 mesh, 98+% Fe.. 63.0¢ to 80.0¢
Carbonyl iron, size 5 to 10 micron, 98%, 99.8+% Fe. 83.0¢ to $1.48
Aluminum ..... 31.5¢
Brass, 10 ton lots .....30.00¢ to 33.25¢
Copper, electrolytic 10.75¢ plus metal value
Copper reduced ...10.00¢ plus metal value
Cadmium, 100-199 lb 95¢ plus metal value
Chromium, electrolytic, 99% min., and quantity, del'd $3.50
Lead .....7.5¢ to 12.0¢ plus metal value
Manganese ..... 57.0¢
Molybdenum, 99% $2.75
Nickel, unannealed ..... 88.0¢
Nickel, annealed ..... 95.0¢
Nickel, spherical, unannealed 92.0¢
Silicon ..... 38.5¢
Solder powder..7.0¢ to 9.0¢ plus met. value
Stainless steel, 302 ..... 83.00¢
Stainless steel, 316 ..... $1.10
Tin .....14.00¢ plus metal value
Tungsten, 99% (65 mesh).. $6.00
Zinc, 10 ton lots .....23.0¢ to 30.5¢



Service that saves...
Quality that pays
...always!

COLD FINISHED STEEL
Controlled
CARBON
and
ALLOY

Manufacturers of Carbon and Alloy Steels—Turned and Polished Shafting—Turned and Ground Shafting—Wide Flats up to 12"x2"

WYCKOFF STEEL COMPANY
SPECIALISTS IN COLD FINISHED STEEL EXCLUSIVELY...
FIRST NATIONAL BANK BLDG., PITTSBURGH 30, PA.
3200 SOUTH KEDZIE AVENUE, CHICAGO 23, ILLINOIS
Works: Ambridge, Pa. • Chicago, Ill. • Newark, N. J. • Putnam, Conn.

Ferroalloy Prices

Ferrochrome
Contract prices, cents per pound, contained Cr, lump size, bulk in carloads delivered. (65-72% Cr, 2% max. Si.)

0.06% C	30.50	0.20% C	29.50
0.10% C	30.00	0.50% C	29.25
0.15% C	29.75	1.00% C	29.00
2.00% C			28.75
65-69% Cr, 4-9% C			22.00
62-66% Cr, 4-6% C, 6-9% Si			22.60

S. M. Ferrochrome
Contract price, cents per pound, chromium contained, lump size, delivered.
High carbon type: 60-65% Cr, 4-6% Si, 4-6% Mn, 4-6% C.

Carloads	21.60
Ton lots	23.75
Less ton lots	25.25

Low carbon type: 62-66% Cr, 4-6% Si, 4-6% Mn, 1.25% Max. C.

Carloads	27.75
Ton lots	30.05
Less ton lots	31.85

High-Nitrogen Ferrochrome
Low-carbon type: 67-72% Cr, 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome price schedule. Add 5¢ for each additional 0.25% N.

Chromium Metal
Contract prices, per lb chromium contained, packed, delivered, ton lots, 97% min. Cr, 1% max. Fe.

0.10% max. C	$1.14
0.50% max. C	1.10
9 to 11% C	1.08

Low Carbon Ferrochrome Silicon
(Cr 34-41%, Si 42-49%, C 0.05% max.) Contract price, carloads, f.o.b. Niagara Falls, freight allowed; lump 4-in. x down, bulk 2-in. x down, 21.75¢ per lb of contained Cr plus 12.40¢ per lb of contained Si.
Bulk 1-in. x down, 21.90¢ per lb contained Cr plus 12.60¢ per lb contained Si.

Calcium-Silicon
Contract price per lb of alloy, dump delivered.
30-33% Ca, 60-65% Si, 3.00% max. Fe.

Carloads	19.00
Ton lots	22.10
Less ton lots	23.60

Calcium-Manganese—Silicon
Contract prices, cents per lb of alloy lump, delivered.
16-20% Ca, 14-18% Mn, 53-59% Si.

Carloads	20.00
Ton lots	22.30
Less ton lots	23.30

CMSZ
Contract price, cents per lb of alloy, delivered.
Alloy 4: 45-49% Cr, 4-6% Mn, 18-21% Si, 1.25-1.75% Zr, 3.00-4.5% C.
Alloy 5: 50.56% Cr, 4-6% Mn, 13.50-16.00% Si, 0.75 to 1.25% Zr, 3.50-5.00% C.

Ton lots	20.75
Less ton lots	22.00

5MZ
Contract price, cents per pound of alloy, delivered, 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe, ½ in. x 12 mesh.

Ton lots	17.50
Less ton lots	19.50

V Foundry Alloy
Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. V-5: 38-42% Cr, 17-19% Si, 8-11% Mn.

Ton lots	16.50
Less ton lots	17.75

Graphidox No. 4
Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. Si 48 to 52%, Ti 9 to 11%, Ca 5 to 7%.

Carload packed	18.00
Ton lots to carload packed	19.00
Less ton lots	20.50

Ferromanganese
78-82% Mn, maximum contract base price, gross ton, lump size.

F.o.b. Niagara Falls, Alloy, W. Va., Ashtabula, O.	$225
F.o.b. Johnstown, Pa.	$227
F.o.b. Sheridan, Pa.	$225
F.o.b. Etna, Clairton, Pa.	$228

Add $2.80 for each 1% above 82% Mn, subtract $2.80 for each 1% below 78% Mn.
Briquets—Cents per pound of briquet, delivered, 66% contained Mn.

Carload, bulk	12.45
Ton lots, packed	14.05

Need
HEAVY
industrial
GEARS
in a
hurry?

Call SIMONDS First!

A call to SIMONDS gives you the benefit of more than 60 years of specialization . . . assures fast, accurate reproduction of the most exacting specifications . . . and SIMONDS' central location cuts delivery time to a minimum. For all types of heavy industrial gears, up to 145" dia. and including cast or forged steel, gray iron, bronze, Meehanite, rawhide and bakelite—SIMONDS' production is geared to serve you promptly.

Stock carrying distributors for Ramsey Silent Chain Drives and Couplings, industrial V-Belts.

SIMONDS GEARS

THE SIMONDS GEAR & MFG. CO.
LIBERTY at 25TH PITTSBURGH 22, PA.

—Ferroalloy Prices—

Spiegeleisen

Contract prices gross ton; lump, f.o.b.

	16-19% Mn 3% max. Si	19-21% Mn 3% max. Si
Palmerton, Pa.	$84.00	$85.00
Pgh. or Chicago	84.00	85.00

Manganese Metal

Contract basis, 2 in. x down, cents per pound of metal, delivered.
96% min. Mn, 0.2% max. C, 1% max. Si, 2.5% max. Fe.

Carload, packed	36.95
Ton lots	38.45

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, cents per pound.

Carloads	30.00
Ton lots	32.00
Less ton lots	34.00 to 37.00

Low-Carbon Ferromanganese

Contract price, cents per pound Mn contained, lump size, del'd Mn 85-90%.

	Carloads	Ton	Less
0.07% max. C, 0.06% P, 90% Mn	28.45	30.30	31.50
0.07% max. C	27.95	29.80	31.00
0.15% max. C	27.45	29.30	30.50
0.30% max. C	26.95	28.80	30.00
0.50% max. C	26.45	28.30	29.50
0.75% max. C, 80-85% Mn, 5.0-7.0% Si	23.45	25.30	26.50

Medium Carbon Ferromanganese

Mn 80% to 85%, C 1.25 to 1.50. Contract price, carloads, lump, bulk, delivered, per lb of contained Mn ..... 21.35¢

Silicomanganese

Contract basis, lump size, cents per pound of metal, delivered, 65-68% Mn, 18-20% Si, 1.5% max. C. For 2% max C, deduct 0.2¢.

Carload bulk	11.40
Ton lots	13.05
Briquet, contract basis carlots, bulk delivered, per lb of briquet	12.65
Ton lots, packed	14.25

Silvery Iron (electric furnace)

Si 14.01 to 14.50 pct, f.o.b. Keokuk, Iowa, or Wenatchee, Wash., $95.50 gross ton, freight allowed to normal trade area. Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., $93.00. Add $1.055 per ton for each additional 0.50% Si up to and including 17%. Add $1.00 for each 0.50% Mn over 1%.

Silicon Metal

Contract price, cents per pound contained Si, lump size, delivered, for ton lots packed.

96% Si, 2% Fe	18.00
97% Si, 1% Fe	18.50

Silicon Briquets

Contract price, cents per pound of briquet bulk, delivered, 40% Si, 2 lb Si briquets.

Carloads, bulk	6.95
Ton lots	8.55

Electric Ferrosilicon

Contract price, cents per pound contained Si, lump, bulk, carloads, delivered.

25% Si	20.00	75% Si	14.30
50% Si	12.40	85% Si	15.55
90-95% Si			17.00

Calcium Metal

Eastern zone contract prices, cents per pound of metal, delivered.

	Cast	Turnings	Distilled
Ton lots	$2.05	$2.95	$3.75
Less ton lots	2.40	3.30	4.55

Ferrovanadium

35-55% contract basis, delivered, per pound, contained V.

Openhearth	$3.00-$3.10
Crucible	3.10- 3.20
High speed steel (Primos)	3.20- 3.25

Pete's right, men! It will pay us to use good tool steel!

COLUMBIA TOOL STEEL COMPANY • CHICAGO HEIGHTS, ILL.

Producers of fine tool steels—High Speed Steels Die Steels—Hot Work and Shock Resisting Steels Carbon Tool Steels.

TOOL COLUMBIA STEELS

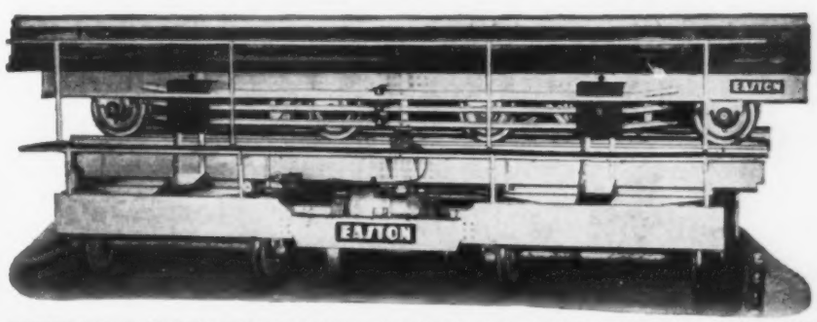
A-1033

EASTON

EASTON experience covers small and large capacity furnace cars for every requirement.

Furnace Cars

Electric furnace car mounted on electric transfer car for completely automatic continuous heat treating system.



EASTON CAR & CONSTRUCTION COMPANY • EASTON, PA. • NEW YORK • PHILADELPHIA • PITTSBURGH

From The Detroit News—July 26, 1952

'Package Plan' of Installing Machinery Is Detroit Idea
One Contract Covers Jobs
Installing an Industrial
INDUSTRIAL PACKAGE PLAN
COMMERCIAL CONTRACTING CORPORATION

Leading the Way

Detroit's Production Methods are Known and Respected—Leading the Way wherever Machinery is Used to Produce Goods. Commercial Contracting Corporation in serving Detroit's vast Automotive Industry developed the INDUSTRIAL PACKAGE PLAN—Integrated Plant Construction with Complete Engineering Services and Installation of Machinery to Provide Savings in Time and Money.

AND THESE SERVICES

General Construction • Building Alterations • Demolition • Foundations • Press Erecting • Machinery Moving • Crane and Conveyor Installations • Process Wiring and Piping • Warehousing • Steel Fabrication • Export Packaging

Write for information on the Industrial Package Plan — Complete Brochure on Request—No Obligation, of Course.

COMMERCIAL CONTRACTING

Corporation

GENERAL CONTRACTORS

TExas 4-7400

12160 CLOVERDALE
DETROIT 4, MICHIGAN

Ferroalloy Prices

Alsifer, 20% Al, 40% Si, 40% Fe, contract basis, f.o.b. Suspension Bridge, N. Y.
- Carloads 9.90
- Ton lots 11.30

Calcium molybdate, 46.3-46.6% f.o.b. Langeloth, Pa., per pound contained Mo $1.15

Ferrocolumbium, 50-60% 2 in. x D, contract basis, delivered per pound contained Cb.
- Ton lots $4.90
- Less ton lots 4.95

Ferro-Tantalum-Columbium, 20% Ta, 40% Cb, 0.30 C. Contract basis, delivered, ton lots, 2 in. x D, per lb of contained Cb plus Ta $3.75

Ferromolybdenum, 55-75%, f.o.b. Langeloth, Pa., per pound contained Mo. $1.32

Ferrophosphorus, electrolytic, 23-26%, car lots, f.o.b. Siglo, Mt. Pleasant, Tenn., $3 unitage, per gross ton $65.00
10 tons to less carload $75.00

Ferrotitanium, 40% regular grade, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti $1.35

Ferrotitanium, 25%, low carbon, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti $1.50
Less ton lots 1.55

Ferrotitanium, 15 to 18%, high carbon, f.o.b. Niagara Falls, N. Y., freight allowed, carload per net ton $177.00

Ferrotungsten, standard, lump or ¼ x down, packed, per pound contained W5, ton lots, delivered $5.00

Molybdic oxide, briquets or cans, per lb contained Mo, f.o.b. Langeloth, Pa. $1.14
bags, f.o.b. Washington, Pa., Langeloth, Pa. $1.13

Simanal, 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per pound
- Carload, bulk lump ..... 14.50¢
- Ton lots, bulk lump ..... 15.75¢
- Less ton lots, lump ..... 16.25¢

Vanadium Pentoxide, 86 - 89% V_2O_5 contract basis, per pound contained V_2O_5 ..... $1.28

Zirconium, 35-40%, contract basis, f.o.b. plant, freight allowed, per pound of alloy.
- Ton lots ..... 21.00¢

Zirconium, 12-15%, contract basis, lump, delivered, per lb of alloy.
- Carload, bulk ..... 7.00¢

Boron Agents

Borosil, contract prices per lb of alloy del. f.o.b. Philo, Ohio, freight allowed, B, 3-4%, Si, 40-45%, per lb contained B.... $5.25

Bortam, f.o.b. Niagara Falls
- Ton lots, per pound ..... 45¢
- Less ton lots, per pound.... 50¢

Corbortam, Ti, 15-21%, B, 1-2%, Si, 2-4%, Al, 1-2% C, 4.5-7.5%, f.o.b. Suspension Bridge, N. Y., freight allowed.
- Ton lots, per pound ..... 10.00¢

Ferroboron, 17.50% min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in. x D. Ton lots.... $1.20
F.o.b. Wash., Pa.; 100 lb up
- 10 to 14% B ..... .85
- 14 to 19% B 1.20
- 19% min. B 1.50

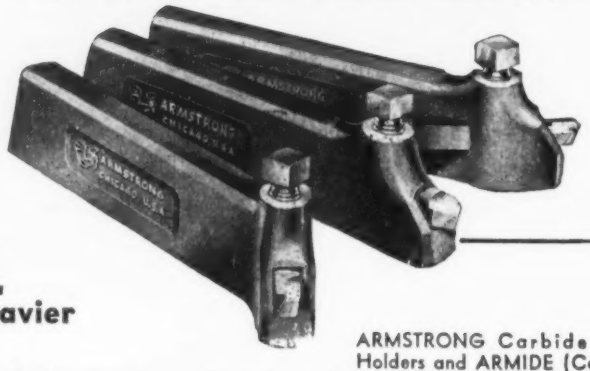
Grainal, f.o.b. Bridgeville, Pa., freight allowed, 100 lb and over.
- No. 1 ..... $1.00
- No. 6 ..... 68¢
- No. 79 ..... 50¢

Manganese - Boron, 75.00% Mn, 15-20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C, 2 in. x D, del'd
- Ton lots $1.46
- Less ton lots 1.57

Nickel-Boron, 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, delivered
- Less ton lots $1.30

Silcaz, contract basis, delivered.
- Ton lots ..... 45.00¢

ARMSTRONG *Carbide* TOOL HOLDERS



For Higher Speeds, and Heavier Feeds

ARMSTRONG Carbide Tool Holders and ARMIDE (Carbide Tipped) Cutters come in cased sets for tool rooms and maintenances departments, and individually in all sizes for general machine shop and production turning. They permit not only the ready machining of sand-filled castings, the hardest and toughest steels as well as many heretofore "unmachinable" materials, but also make practical much heavier cuts and cutting speeds up to 600 f.p.m. on ordinary work. They also run from 10 to 100 times as long between regrindings.

Write for Catalog

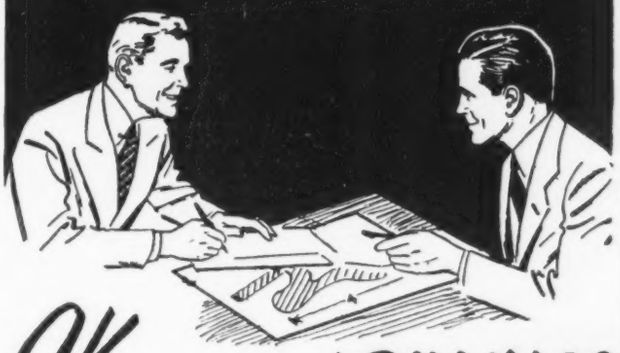
ARMSTRONG BROS. TOOL CO.

"The Tool Holder People"

5209 WEST ARMSTRONG AVE., CHICAGO 30, ILLINOIS

NEW YORK • SAN FRANCISCO

"A FORGING WILL DO IT"



OK. contact BILLINGS

Skilled forging engineers are ready to assist in producing forgings correct in dimensions and with the maximum physical properties necessary for the job intended. Our hammers talk production!

Send prints or specs to 40 Laurel St.

BILLINGS

C2

THE BILLINGS & SPENCER CO. HARTFORD 1 CONN. U.S.A.

WRENCHES • SHOP TOOLS • INDUSTRIAL FORGINGS SINCE 1865

what's your perforating problem

STEEL AVAILABLE FROM ACCURATE'S STOCK

Let Accurate Perforating Company tackle your job—and you'll have the advantage of best in performance and price! Accurate offers you a wide selection of perforating dies—quick and dependable service. Save money—time—and uncertainty by getting the *right* perforation for your particular needs. Write today for your free catalog on Accurate perforated materials.

SERVING THESE INDUSTRIES:

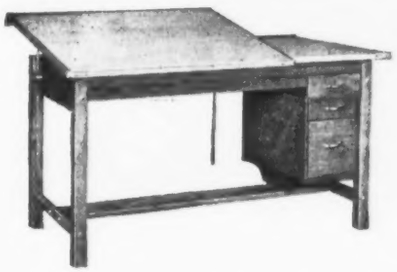
AIRCRAFT • AUTOMOTIVE • COMMUNICATIONS • ELECTRICAL EQUIPMENT • FARM MACHINERY • HEATING • RADIO AND RADAR • RAILROADS • SHIP BUILDING • WASHING MACHINES

IN THESE MATERIALS:

ALUMINUM • BRASS • BRONZE • COPPER • LEAD • MONEL METAL • STEEL • MASONITE • STAINLESS STEEL • PLYWOOD • PAPER • CLOTH

ACCURATE
perforating company
1101 SOUTH KEDZIE AVENUE • CHICAGO 12, ILLINOIS

MAYLINE



Mayline 4-Post Drafting Table with Reference Top

A table with a reference surface, especially suited to those draftsmen and engineers who require extra space. It has an adequate surface for blueprints, notes, books, tools, and other drafting accessories.

Illustrated with the table is an auxiliary drawer unit. This has a supply drawer and a file drawer. This unit must be ordered separately.

See your local dealer or write to factory.

ENGINEERING MANUFACTURING CO.
637 No. Commerce St. Sheboygan, Wis.

MAYLINE

MAYLINE

MAYLINE

MAYLINE

ELECTROLIFT

your "ONE MAN CREW"

Here's a worm drive hoist that will speed materials handling throughout your plant. *One man* can handle up to 6 tons faster and more safely than any crew.

With savings in time, power and labor, and prevention of accidents, any ElectroLift hoist will quickly pay for itself. Wide variety of models, with optional pushbutton control.

For further features, consult your ElectroLift representative in telephone directory.

ELECTROLIFT

ELECTROLIFT, INC., 30 CHURCH ST., NEW YORK 7, N. Y.

WE MAKE THE STEEL -

All of our steel is made in our Heroult Basic Electric Steel Furnaces. We use only electric steel because it is cleaner and subject to closer control. This means your forgings are of the best quality obtainable.

NATIONAL FORGE & ORDNANCE COMPANY
IRVINE, WARREN COUNTY, PENNA.

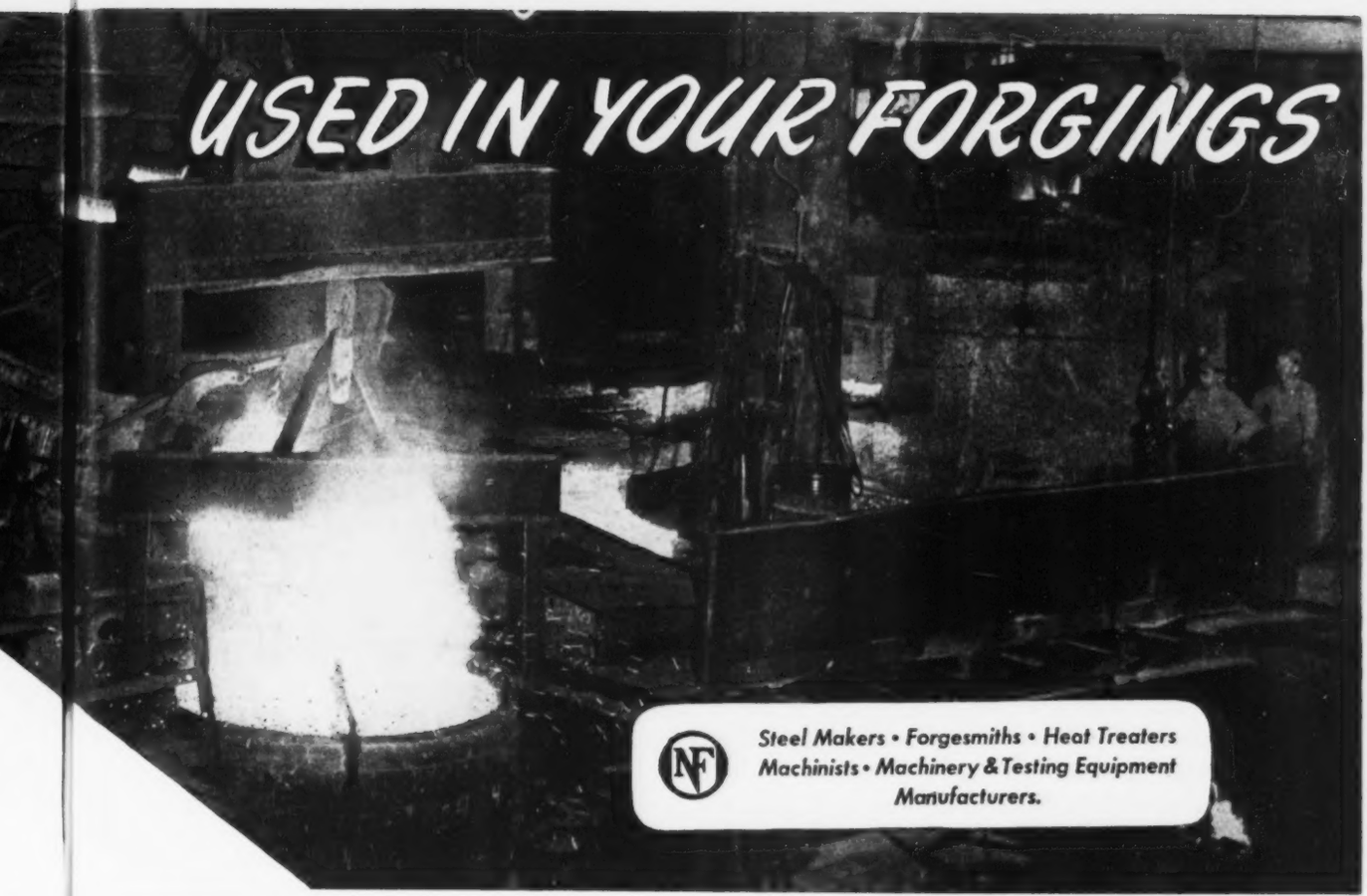
BENDING FULL CIRCLES

On A Pedrick Production Bender

The Pedrick Production Benders are very suitable for bending full circles. The machine shown makes a coil of bends; the coil is then cut through with an abrasive wheel and as many full circles result as are wrapped in the coil. This bending process permits a minimum cut-off waste of material as well as reduces the number of cutting operations. The same machine can be used for conventional bending of pipe, tubes, reinforcing bars, etc.

Write for Descriptive Folder

PEDRICK TOOL AND MACHINE COMPANY
3640 N. LAWRENCE ST., DEPT. 2, PHILADELPHIA 40, PA., U.S.A.


USED IN YOUR FORGINGS
Steel Makers • Forgesmiths • Heat Treaters
Machinists • Machinery & Testing Equipment
Manufacturers.

FOUNDRY SERVICE

IRON, STEEL, NON-FERROUS CASTINGS
GEAR CUTTING, MACHINE WORK

Pouring steel castings at
AVONDALE'S Foundry Division

The top quality of SERVICE FOUNDRY work has become famous in the industry. Expert metallurgical control insures uniformity of quality in casting; expert workmanship in gear-cutting and in our machine shop; expert handling throughout the entire SERVICE FOUNDRY operation— from office force to delivery— has made our name what it is today!

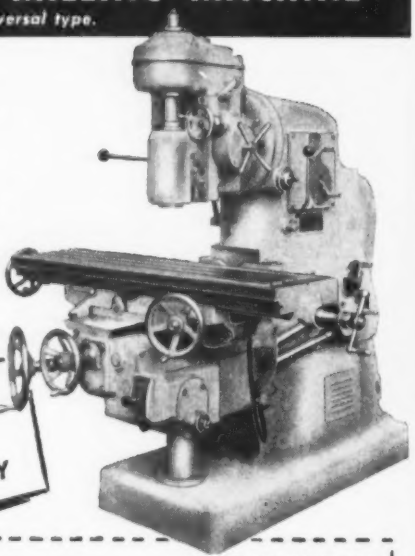
service foundry – a division of

416 Erato Street, New Orleans 13

avondale marine ways, inc.
P. O. Box 1030, New Orleans 8

NEW HURÉ PRECISION
VERTICAL MILLING MACHINE
Also available in Universal type.

Built in France to accurate American specifications and measurements, this sturdy machine incorporates all the latest developments in machine tool design . . . with special features that years of experience have proved highly desirable in milling machines of this type.



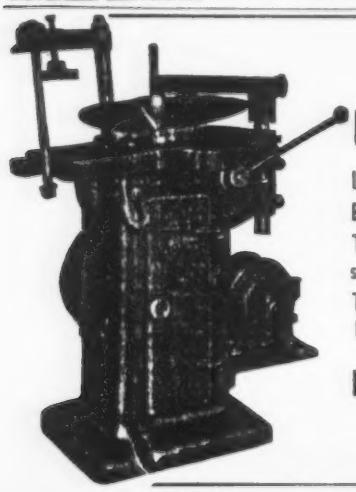
NO PRIORITIES STOCK DELIVERY

PARTIAL SPECIFICATIONS	MODEL 273	MODEL 274
Long. feed range	32"	37-25/64"
Cross feed range	14⅜"	16-9/64"
20 speeds range RPM	20 to 1600	20 to 1600
Motor	6	7

• Write today for illustrated folder giving full details.

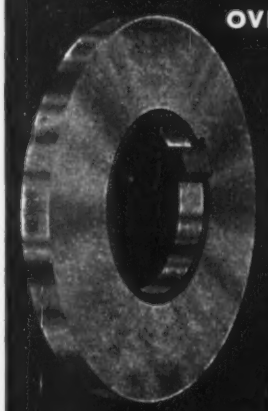
MOREY ...for machine tools!
MOREY MACHINERY CO., INC.
Manufacturers • Merchants • Distributors
410 BROOME ST. • NEW YORK 13, N. Y.
TELEPHONE: CANAL 6-7400
CABLE ADDRESS: WOODWORK, N. Y.

Versatility counts in
HOT DIP GALVANIZING
any size or shape product, any size
order from the smallest to the largest
Excellent facilities for Pickling and Oiling
ENTERPRISE
GALVANIZING COMPANY
2526 E. Cumberland St. Philadelphia 25, Pa.



"DAVIS" KEYSEATER
Low in Cost. Durable.
Easy to operate.
Table adjustable for straight or taper keyways.
Three sizes. Keyways 1/16" up to 1".
DAVIS KEYSEATER CO.
400 Exchange St.
Rochester 8, N. Y.

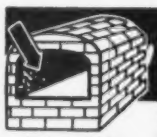
COWLES
GANG SLITTING KNIVES
OVER 30 YEARS EXPERIENCE



Standard for Service and Durability. Ground to extremely close Tolerances and Finish. Made by Toolmakers.
COWLES TOOL COMPANY
2086 W. 110th ST. CLEVELAND 2, OHIO

SQUARE BEVEL WASHERS

We Stock All Sizes
LANCASTER MALLEABLE CASTINGS CO.
LITITZ & KELLER AVE. • LANCASTER, PA.



SAUEREISEN
HIGH-TEMPERATURE CEMENTS
Write for Catalog and Quantity Prices.
For laying and coating brickwork, forming refractory shapes or furnace linings on the job, and making patches to existing structures.
TRIAL ORDER FOR REFRACTORY USE
Handy quart cans for making comparative tests —5 different cements.
$6.75
Sauereisen Cements Company • Pittsburgh 15, Pa.

PIPE and AUTOMOTIVE PLUGS and FITTINGS
Ferrous & Non-Ferrous
PITTSBURGH PLUG AND PRODUCTS CO.

Pittsburgh 15, Pa. • • • Evans City, Pa.

HOT DIP GALVANIZING
JOSEPH P. CATTIE & BROTHERS, INC.
Office: 2409 E. York St.
Plant: Letterly & Gaul Sts.
Phone: Re-9-8911 Phila. 25, Pa.

If It's Action You're After . . .
Advertise it in The Iron Age. Those who make the buying decisions in metalworking watch The Iron Age advertising pages closely.

STAMPINGS

Since 1905 Hubbard has been making PARTS LIKE THESE

Consult us about them

M·D·Hubbard Spring Company

302 Central Avenue • Pontiac 12, Mich.

For Better Coolant Flow

choose

RUTHMAN GUSHER COOLANT PUMPS

Each Gusher Coolant Pump is the result of years of experience in building a *better* pump to give you *better* coolant flow. You get as much or as little as you want the instant you turn on the machine.

No packing or priming is needed . . . rotating parts are electronically balanced to cut vibration to a minimum . . . pre-lubricated heavy duty ball-bearings need no further attention.

So choose wisely—choose Ruthman Gusher Coolant Pumps.

THE RUTHMAN MACHINERY CO.

1809 Reading Road Cincinnati 2, Ohio

ELECTRIC FURNACE

STEEL CASTINGS

Deliver Seven Most Important Features

Sound, clean, true-to-pattern steel castings possess:

1—**Uniform Structure**—giving greater strength throughout.

2—**Efficient Distribution of Metal**—for better weight-strength ratio.

3—**Wide Range of Mechanical Properties**—to fit your specific needs.

4—**Minimum Machining**—for lower production costs.

5—**Dimensional Stability** — for better fit and better performance.

6—**Ease of Assembly** — for fabrication with other parts.

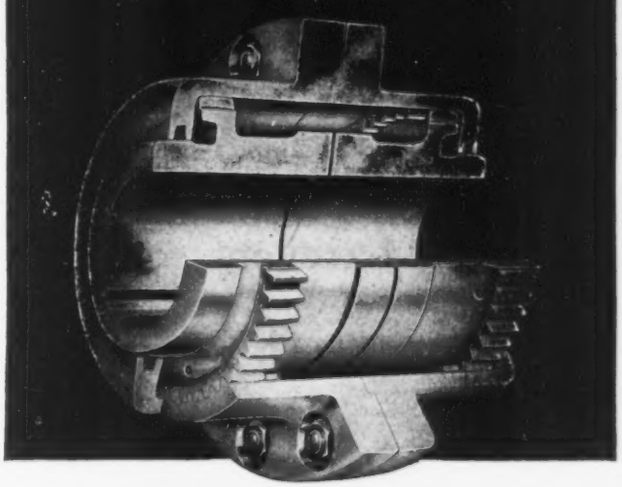
7—**Toughness and Fatigue Resistance** —for longer life, less replacement.

We furnish this quality of product and by cooperating with your engineers in matters of design and pattern construction assist you to secure castings of maximum strength, minimum weight and utmost economy.

CRUCIBLE STEEL CASTING CO.

LANSDOWNE, PENNA.

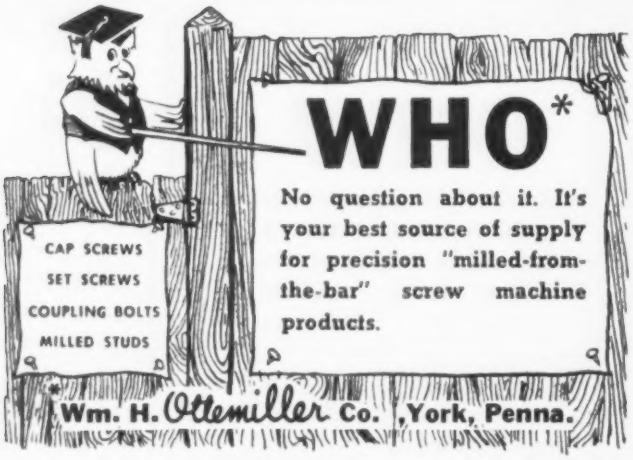
POOLE



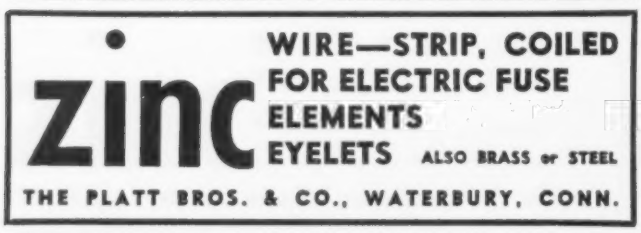
A COPY OF CATALOG GIVING FULL DESCRIPTION AND ENGINEERING DATA SENT UPON REQUEST.

FLEXIBLE COUPLINGS

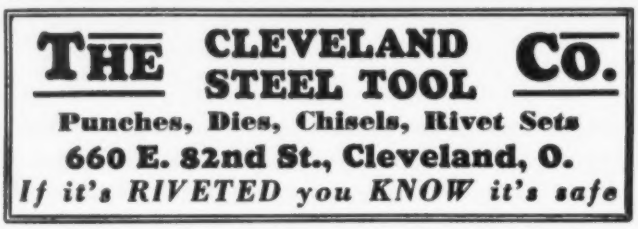
POOLE FOUNDRY & MACHINE COMPANY WOODBERRY, BALTIMORE, MD.


WHO*
No question about it. It's your best source of supply for precision "milled-from-the-bar" screw machine products.
CAP SCREWS
SET SCREWS
COUPLING BOLTS
MILLED STUDS
Wm. H. Ottemiller Co. York, Penna.

HAYWARD BUCKETS
Use this Electric Motor Clam Shell for rehandling bulk materials in Industrial Plants
THE HAYWARD CO., 40-50 Church St., N.Y.
OHIO LOCOMOTIVE CRANES
25 TO 50 TON CAPACITY
DIESEL • GASOLINE • ELECTRIC • STEAM
THE OHIO LOCOMOTIVE CRANE CO.
BUCYRUS, OHIO



GOSS and DE LEEUW
MULTIPLE SPINDLE
CHUCKING MACHINES
Four, Five, Six, Eight Spindles • Work and Tool Rotating Type
GOSS & DE LEEUW MACHINE CO., KENSINGTON, CONN.



THE MOST SUCCESSFUL SALESMAN IN THE INDUSTRY

97 Years' experience, has
excellent contacts with 97%
of the buying power in the
metalworking industry.
Will make 137,000 calls
every week – the Iron Age

your best buy in modern milling machines:

Plain or Universal

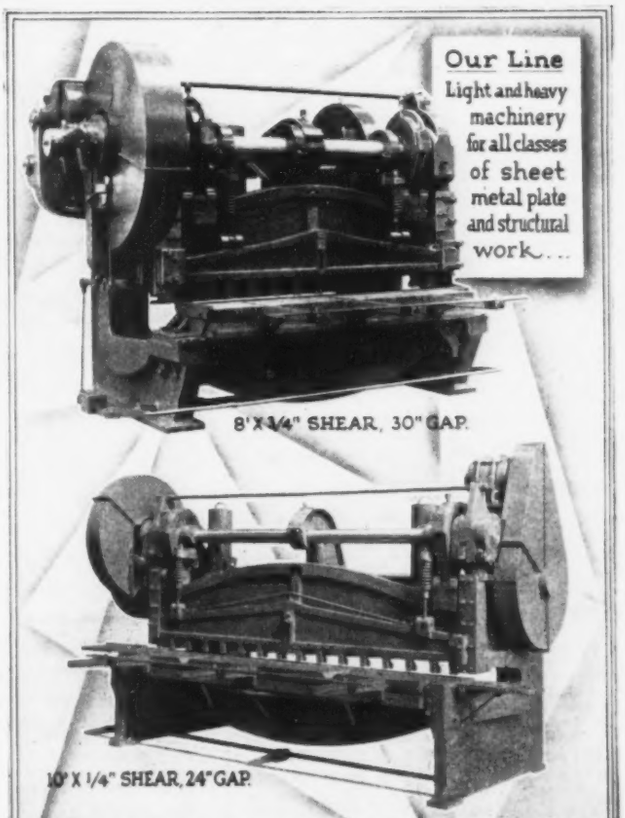
- **Offers every modern milling machine advantage:** 18 spindle speeds 25 to 1250 rpm, 18 feeds ½" to 30" per minute, rapid traverse, Timken bearings and many others.

You can't buy a better combination of simplicity, rugged construction, ease of operation, accuracy and production speed.

Send for bulletin and price list.

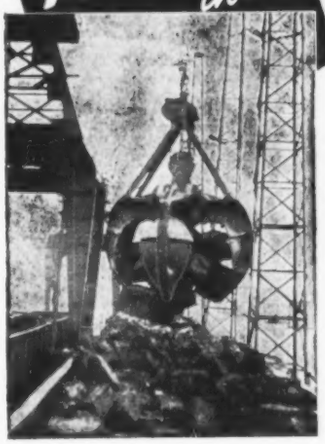
GREAVES

THE GREAVES MACHINE TOOL CO.
2400 Eastern Avenue, Cincinnati 2, Ohio


Our Line
Light and heavy machinery for all classes of sheet metal plate and structural work...
8' X 1/4" SHEAR, 30" GAP.
10' X 1/4" SHEAR, 24" GAP.

BERTSCH & COMPANY
CAMBRIDGE CITY INDIANA

FROM PILE TO CAR *in the* LEAST TIME



Via the
OWEN
HI SPEED
METHOD

To handle the biggest volume of scrap iron in the least time, with the lowest operating cost.

That, roughly is the job which confronts yard operators today.

Every day more and more Owen Scrap Grapples are aiding in solving these problems.

Their independently acting tines dig deeply into the scrap of various kinds and lift capacity loads for vital defense uses.

Owen Scrap Iron Grapples merit your immediate investigation. Write now.

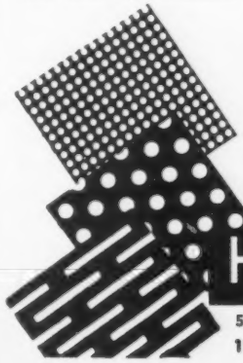
THE OWEN BUCKET COMPANY
6011 BREAKWATER AVE. • CLEVELAND, OHIO
BRANCHES: New York, Philadelphia, Chicago, Berkeley, Calif.

OWEN NEW METHOD SCRAP HANDLING

Perforated
SHEET MATERIALS
Metals—Plastics
Fabrikoids
and Others
at
H & K

from Tissue Thickness to 1" STEEL PLATES

Unlimited Choice of Patterns
•
Accurate Holes Smooth Surfaces
•
Design Facilities for New Applications



HERE AT H & K, you'll find an intelligent consideration of your industrial problems. Maximum cooperation is afforded designers and product engineers in the creation of Perforated Metals and other materials . . . providing the desired end results at lowest possible cost.

H & K Perforated means an extremely wide choice of sheet materials (coil and plate form, too) at your command. Stainless Steel is a perforating specialty at H & K. Monel, Brass, Bronze and Aluminum are others. Non-Metals include various Plastics, Cellophane, Foil, Masonite and a host of others. Write at once for full information.

Also Remember—H & K Grilles . . . Ultimate in Beauty . . . Utility . . . LONG LIFE!

The Harrington & King PERFORATING Co.
5657 FILLMORE ST., CHICAGO 44, ILLINOIS
114 LIBERTY STREET, NEW YORK 6, N. Y.

CONSIDER GOOD USED EQUIPMENT FIRST

BELT GRINDING UNIT
Hill Clutch & Machine & Fdry. Co. Open Side Abrasive Belt Grinding Unit, Designed to accommodate slabs up to ⅜" thick x 30" wide x 30' long.

BRAKE—LEAF TYPE
16' x ¾" Dreis & Krump Leaf Type Bending Brake, Motor Driven with 40 H.P. A.C. Motor.

BUILDING
72'6" x 140' Steel Building—NEW—Designed for Corrugated Steel Siding and to carry load of 30 ton overhead electric traveling crane.

CHARGING MACHINE
6000 lb. Brosius Floor Type Gasoline Driven Charging Machine. Equipped with Peel, Gasoline Engine, Rubber Tires.

CRANE—GANTRY
5 ton Whiting Two Leg Gantry Crane 52 Ft. Span Cab Control. Three Motors 220 v. 3 ph. 60 cy.

CRANE—LADLE
75 ton Morgan Ladle Crane 49'6" Span 4-Girder, With 25 Ton Auxiliary, Complete with 230 Volt D.C. Motors.

FLANGING MACHINE
¾" McCabe Pneumatic Flanging Machine, Pneumatic Holddowns, Circle Flanging Attachment.

FORGING MACHINE
5" Ajax Forging Machine or Upsetter, Motor driven. Equipped with Air Clutch.

FURNACES—MELTING
400 lb. Moore Type "UT" Melting Furnace Top Charge. Complete with Transformer. New 1943—Little Used.
15 ton Heroult Model V-12 Electric Melting Furnace Top Charge hydraulically operated. Complete with Transformer Equipment.
25 ton Moore Size "NT" Melting Furnace, with 7500 KVA Transformer 13,200 vo. 3 ph. 60 cy.

HAMMER—COUNTER BLOW TYPE
35 ton Counter Blow Drop Forge Hammer Steam or Air Operated.

LEVELER—ROLLER
60" Aetna-Standard Roller Leveler, Motor Driven. 17 Rolls 4⅜" dia.

PLANERS
48" x 48" x 20' Cincinnati, Four Head
48" x 48" x 12' Niles-Bement-Pond, Four Head
60" x 60" x 12' Niles-Bement-Pond, Four Head
72" x 72" x 12' Niles-Bement-Pond, Four Head

PLATING MACHINE
Type "B" Crown Full Automatic, Nickel & Chrome Plating Machine, Max. Work Size 16" wide x 36" deep x 4" thick.

PRESS—BRIQUETTING
Model BL-350 Milwaukee Hydraulic Briquetting Press, Complete with Pumps. Capacity Grey Iron Briquettes 3½ tons per hr.

PRESS—KNUCKLE JOINT
1000 ton Bliss #27 Knuckle Joint, Embossing & Coining Press, 2½" stroke, 18" Shut Height.

PRESSES—TRIMMING
1500 ton Hydraulic Bending & Trimming Press, Distance between columns 86" x 86".
2500 ton Hydraulic Bending & Trimming Press, Distance between columns 90" x 108".

ROLLING MILLS
8" x 10" Schmitz Single Stand Two High With Friction Drive Rewinder.
12½" x 16" Philadelphia Two High Cold Rolling Mill. Complete with Pinion Stand, 75 H.P. Motor 440/3/60. Starter and Controls, Incl. Coiler.
18" x 24" Waterbury Farrel Two Stand Two High Rolling Mill. Complete with Elec. Equip.
18" x 60" Three High Roughing Mill, Complete with billet heating furnace and accessory equipment including electrical equipment.
27" x 56" United Two High Skin Pass Mill.

STRAIGHTENERS
No. 3 Medart 3-Roll Straightening Machine Capacity 1" to 3½" Bars or 4½" O. D. Pipe or Tubing. NEW 1950.
No. 1B Sutton Round Straightener, Motor Drive, Capacity 3/16" to ¾" O.D. Friction Drive complete with 1/3 H.P. A.C. Motor.

TESTING MACHINE
20,000 lb. Southwark-Emery Universal Hydraulic Testing Machine.
300,000 lb. SOUTHWARK-EMERY Universal Hydraulic Testing Machine.

UNIVERSAL IRONWORKER
No. 28U-30 Buffalo Armor Plate Universal Ironworker — Combination Punch, Shear & Bar Cutter. Motor Driven Capacities — Shear 3" Round, 2⅝" Square, 5x1⅝" Flat, 5x5x⅝" Angles 12"—31½# Beams, etc., Punch 1½" thru 1¼".

RITTERBUSH & COMPANY, INC.
50 Church Street, New York 8, N. Y.
Phone—Cort 7-3437

The Clearing House

NEWS OF USED, REBUILT AND SURPLUS MACHINERY

Buzz—No Honey—If inquiries were orders, the used machinery market in the Pittsburgh area would be a beehive of activity. Unfortunately few of the calls turn into sales.

Buyers are shopping around but not many are in a mood to lay money on the line. Quite a few of the inquiries are from dealers who are apparently trying to line up machines in anticipation of possible orders.

Overall, however, most of the used machinery dealers around Pittsburgh believe the business tempo has quickened since the sluggish summer months. Strongest demand is for radial drills, lathes and grinders. The small buyer has just about vanished from the market and most of the buying interest comes from large companies.

Mill Market — Most optimistic dealers are those handling steel mill equipment. Activity is not at the level they would like, but many of the leading used machinery firms in the area have deals that may be closed at any moment. In one case, a Western steel producer is just about ready to complete purchase of a 10-ft 1-in. plate shear.

One of the oddities of the Pittsburgh market is the fact that deals for mill machinery often hang fire for as much as 2 years. One dealer estimated average time lapse between inquiry and sale closing at 6 months. Foreign orders in particular are likely to drag on for months with the transaction frequently delayed because of a lack of dollars.

Like New—Used cranes are hitting the market in greater volume and buyers of small units are becoming more particular. Some are even insisting on such refinements as roller bearings and magnetic controls like those found on new cranes.

Another example of the frustration caused by price ceilings based on equipment age cropped up in Pittsburgh recently. A dealer acquired a 10-ton crane that had been in use for only 3 months, but because of its age the most he could charge for the machine was 55 pct of its original value.

No Change — Dealers in the Philadelphia area report business is still slow. Problem of finding late model desirable equipment has not eased in the slighest.

Philadelphia dealers continue to push the idea of having the Pennsylvania R.R. pick up machines that are to be shipped by rail. At present the dealers have to arrange their own method of getting machines from their warehouses to the freight yards. The system of having railroads call for used machinery at the dealer's warehouse is standard practice in a few other cities where the volume of traffic is heavy.

Pennsylvania R.R. is going to survey shipments of used machinery out of Philadelphia to determine the amount of tonnage involved. It is expected that a decision will be reached by the first of the year.

Stolen—Theft of a No. 2 G Automatic Brown & Sharpe Screw Machine from a plant in Plymouth, Mich., is reported in the latest issue of the Machinery Dealers' National Assn. paper. The thieves broke into the plant on Sept. 20th and removed the machine from its cement base. They also walked off with some collets, pushers and tools.

Serial number of the screw machine is 9147. Anyone who may happen to come across the stolen machine is urged to contact the MDNA office, 1346 Connecticut Ave., N.W., Washington 6, D. C. (Tel. No. Columbia 1336), or to notify John D. Horwith, International Machinery Co., 3135 E. Jefferson Ave., Detroit 7, Mich. (Tel. No. Loraine 7-6580). A $500 reward has been offered for information leading to the recovery of the machine.

CONSIDER GOOD USED EQUIPMENT FIRST

AIR COMPRESSORS
14" x 12" Pennsylvania Air Compressor, 100# Pressure, Complete with 75 H.P. Syn. Motor
18" & 11" x 14" Sullivan WJ-3 Air Compressor 885 CFM, Driven by 150 H.P. Westinghouse Syn. Motor 440/3/60

BAR TURNING MACHINE
Medart HF-2 Bar Turning Machine, Capacity 1" to 2½", Complete with Accessories

BENDING ROLLS
6' x ⅝" Ryerson Pyramid Type Bending Roll
20' x 1" Southwark Pyramid Type Bending Roll
30' x 1" Southwark Pyramid Type, Motor Driven

BRAKES—LEAF TYPE
8' x ¼" Dreis & Krump Leaf Type Bending Brake Motor Driven with 5 H.P. A.C. Motor
12" x 3/16" Chicago #226 Steel Apron Brake, M.D.
16' x ⅝" Dreis & Krump Leaf Type Bending Brake, Motor Dr. with 40 H.P. A.C. Motor

BRAKES—PRESS TYPE
14' All Steel Hydraulic Press Brake 500 Ton Capacity, ½"
10' x 3/16" Dreis & Krump Press Brake, Complete with Electrical Equipment

BUILDING
72'6" x 140' Steel Building — NEW — Designed for Corrugated Steel Siding—and to carry load of 30 ton Overhead Electric Traveling Crane

BULLDOZER
#9 Williams White Bulldozer, Motor Dr. with 50 H.P. Motor, 440 volt, 3 phase, 60 cycle. Face of Crosshead 20" x 90". Movement of Crosshead 24"

CHARGING MACHINE
6000 lb. Brosius Floor Type Gasoline Driven Charging Machine, Equipped with Peel, Buda Gasoline Engine, Rubber Tires

CRANES—GANTRY
5 ton Whiting Two Leg Gantry Crane 52' Span Cab Control Motors 220 v, 3 ph, 60 cy.
15 ton P&H Two Leg Gantry Crane 45' Span With 13' Overhand one end 10' other end 5 ton Auxiliary, Two Trolleys and 5 Motors 440 volt 3 phase 60 cycle

CRANE—LADLE
75 ton Morgan Ladle Crane 49'6" Span 4-Girder Construction, with 25 Ton Auxiliary, Complete with Motors for 230 Volt D.C.

CRANES—OVERHEAD ELECTRIC TRAVELING

5 ton Robbins Myers	28'6" Span 220/3/60
10 ton Shaw	67' Span 230 Volt D.C.
10 ton P & H	40' Span 440/3/60 AC
10 ton Erie	60' Span 440/3/60 AC
15 ton Niles	60' Span 230 Volt D.C.
15 ton Toledo	48' Span 220/3/60
20 ton Bedford	50' Span 220/3/60 AC
20 ton Morgan	68' Span 230 Volt DC

With 5 ton Auxiliary

DIEING MACHINES
75 ton Henry & Wright High Speed Dieing Machine Double Roll Feed, Scrap Cutter, 3" Stroke
100 ton Henry & Wright Dieing Machine, 4" Stroke. 13" Shut Height. Complete Elecl. Equip.

DIE CASTING MACHINES
Model BA-12 KUX Die Casting Machine, Air operated. Plunger Gooseneck Type for zinc, lead and tin. Die space between bars 12¼" x 12¼", Die Separates 8" NEW 1949, never used
Pratt & Whitney Type BL-2416 Single Spindle 3-Dimensional Keller Machine, with complete electrical equipment and accessories

DRAW BENCH
50,000 lb. Draw Bench, Motor Driven with 50 H.P. Motor. Maximum Draw 40 ft.

FLANGING MACHINE
¾" McCabe Pneumatic Flanging Machine, Pneumatic Holddowns, Circle Flanging Attachment

FORGING MACHINES
1½", 2", 3", 4", 5", Ajax
1", 2", 3", 5", Acme
5 Ajax—Air Clutch

FURNACE—ANNEALING
Furnace Engr. Co. Bell Type Annealing Furnace Gas Fired. Operating Space 40"x10" Round. 500 CFM Capacity.

FURNACE—HEATING
60 KW Leeds & Northrup Homo Furnace #9478-UB-28, With controls. Work space 28" dia. x 28" deep

FURNACES—MELTING
400 lb. Moore Type "UT" Melting Furnace. Top Charge. Complete with Transformer. New 1943—Little Used
6000 lb. E.I.S. Nose Tilting Furnace. Complete with Transformer Equipment
15 ton Heroult Model V-12 Top Charge Hydraulically Operated. Complete with Transformer Equip.

GEAR REDUCERS
500 H.P. United Combination Reduction Gear & Pinion Stand. Gear Ratio 8.581:1
600 H.P. Farrel Birmingham, Size 18 Reduction Gear, Ratio 720 to 244 RPM
700 H.P. Falk Single Reduction Gear, Ratio 875 to 200 RPM
1800 H.P. Mesta Gear Reduction Unit, Ratio 19:1

GRINDER
No. 4 Cincinnati Centerless Grinder, Motor Driven. Capacity standard work rest 2" to 6" dia., optional work rest ⅛" to 3". Special fixtures will allow work to be handled up to 9" dia.

GRINDER—CYLINDRICAL
14 x 36" Norton Type C. Complete with Elecl. Equip.

HAMMERS—BOARD DROP
1200, 1600, 4000 lb. Model J2 Chambersburg
1000 lb. Billings & Spencer

HAMMER—COUNTER BLOW TYPE
35 ton Counter Blow Drop Forge Hammer, Steam or Air Operated

HAMMER—STEAM DROP
1500, 4000 lb. Erie

HAMMERS—STEAM FORGING
1200 lb. Massillon Single Frame
1500, 1600, 2000, 3000, 4000 lb. Chambersburg
600, 1500, 2500 lb. N.B.P.
600, 1100, 1500, 2000, 2500, 3500, 4000 Erie

HAMMERS—MISCELLANEOUS
No. 6N Nazel Hammer, Geared Motor Drive
200 lb. Bradley Compact Hammer, Arr. for Motor Drive with 10 H.P. A.C. Motor
2000 lb. Chambersburg Pneumatic Hammer Complete with Elect. Equip. New 1951
15"x12" Chambersburg Cecostamp Hammer, 18" stroke

LATHE—TURRET
Model 2L Gisholt Geared Head Turret Lathe, Spindle Bore 4-1/16". Elecl. Equipment and numerous accessories incl. NEW 1951

LEVELER—ROLLER
60" Aetna Standard 17-Roll Leveler, 4⅜", Dia. Rolls Arr. Motor Drive

MOTORS
1250 H.P. Westinghouse Induction Motor 6600 volt 3 phase 60 cycle 593 R.P.M.
2000 H.P. General Elec. Induction Motor 6600 volt 3 phase 60 cycle 600 R.P.M.
2500 H.P. General Elec. Direct Current Motor 6600 volt 175/350 R.P.M.

MOTOR GENERATOR SET
740 H.P. General Electric Syn. Motor 4400 volt A.C. with two generators 750 KVA 230 volt D.C., Complete with Panel Board, etc.

NAIL MAKING MACHINES
No. 1½ National—Sizes 10D, 12D, 16D, 20D, 30D
No. 3 National—Size 6D
No. 2 Glader—Sizes 6D, 7D, 8D, 9D
Angell—Sizes 10D, 12D, 16D, roofing

PRESSES—EXTRUSION
700 ton Horizontal Extrusion Press, 3-Column Type Ram 26" Diameter, Container suitable for billets 5" x 20"
1200 ton Horizontal Extrusion Press, 3-Column Type Ram 34" Diameter, Suitable for billets 6" dia. x 22" long

WE OFFER A COMPLETE LIQUIDATION SERVICE ON ANY BASIS WHICH CIRCUMSTANCES INDICATE WOULD BE MOST BENEFICIAL, WHETHER BY AUCTION, PRIVATE LIQUIDATION OR OUTRIGHT SALE

CONSULTANTS IN MANUFACTURING PROBLEMS FOR OVER A QUARTER OF A CENTURY

THERE IS NO SUBSTITUTE FOR EXPERIENCE

CONTACT US IN CONFIDENCE WITHOUT COST OR OBLIGATION

PRESSES—HYDRAULIC
Model 3L-350 Milwaukee Hydraulic Briquetting Press Complete with Pumps. Capacity Grey Iron Briquettes 3½ tons per hr.
75 ton Williams White Straightening Press 27" Stroke, Bed 8' x 16", 6½" Dia. Ram
200 ton Bliss Hydrodynamic 48" Stroke Bed Area 24" x 24", Hyd. Pump Incl.
500 ton Southwark Hydraulic 24" Stroke, 78" Daylight Platen 64" R to L. x 32" F to B
500 ton Southwark Open Throat Hydraulic Press 12" Stroke Platen 56" x 56"
700 ton Elmes Forming Press, 27" Stroke, 30" Dia. Ram, Platen 40" x 88" with overhang 40" x 129", Complete with Pump and Motor

PRESS—HYDRAULIC WHEEL
100 ton Elmes Inclined Hydr. Wheel Press 72" Between Parallel Bars. Complete with Pump & Motor

PRESS—KNUCKLE JOINT
#27 Bliss Knuckle Joint Embossing & Coining Press 1000 ton Capacity, 2½" Stroke, 18" Shut Height

PRESSES—STRAIGHT SIDE
No. 87A Bliss 250 Ton Capacity, Double Geared 32" Stroke, 30" x 33" Bed Area, Air Cushion
No. 305 Bliss 9" Stroke 14" Shut Height Equipped with Marquette Air Cushion
No. 59 Toledo Double Geared Tie Rod Press 255 ton Friction Clutch 18" Stroke 36¼" x 35" Bed Area
No. 3 Ferracute Super Speed Punch Press 30 ton Capacity. NEW 1946—never used
No. 675B Bliss Single Geared 1⅞" Stroke, Double Roll Feed & Chopper, 10 H.P. A.C. Motor
No. 620 Bliss High Production Press. 1⅛" Stroke
SI-40 Verson 200 ton Press, 30" Stroke Bed Area 40" x 44"
No. 12 Zeh & Hahnemann Patent Percussion Press 150 ton 12" Stroke. 17" x 17" Bed Area
No. 1037-⅝ Hamilton 300 Ton 16" Stroke Bed Area 48" x 104"

PRESSES—TRIMMING
Bliss S.S. Trimming Press with Side Shear, 250 Ton Capacity, 8" Stroke 52" x 30" Bed Area
No. 3 Erie Flywheel Drive Trimming Press, 3⅜" Stroke 13" Between Guides
No. 1S Erie Trimming Press, 100-150 Ton
1500 ton Hydraulic Bending & Trimming Press. Distance between columns 86" x 86"
2500 ton Hydraulic Bending & Trimming Press. Distance between columns 90" x 108"

PUNCH—BEAM
Long & Allstatter Double End Beam Punch, Capacity Beam Punch End—Punch flanges and web 24" I-beam and smaller

PUNCH & SHEAR COMBINATIONS
No. 28 U-30 Buffalo Armor Plate Universal Ironworker. Capacity Punch 1¾" thru 1¼", Shear 3" Round 3⅝" Square, 3 x 1⅝" Flat, 5 x 5⅝" Angles
Style EF Cleveland Single End Punch & Shear, M.D. Capacity Punch 1" thru 1¼"

RIVETER
125 ton Hanna Buil Riveter, Air Driven, 24" Gap, 75" Reach, Capacity 1" rivets cold and 1½" rivets hot

ROLL—PLATE STRAIGHTENING
7 Roll Bertsch Plate Straightening Machine, Capacity 10' x ⅝", Complete Elecl. Equip.

ROLLING MILLS
7½" Steckel Four High Rolling Mill, Max. Steel Width 6", Work Rolls 2½" x 7½", Complete with electrical equipment
8"x10" Schmitz Single Stand Two High
12"x16" Single Stand Two High, Comp. with Elecl. Equip.
12"x24" Waterbury Farrel Two High
15"x30" Mossberg Single Stand Two High
18"x21" Waterbury Farrel Two Stand Two High
20"x30" Two Stand Two High Rolling Mill
20"x36" Poole Two Stand Two High
22"x40" Single Stand Two High
27"x56" United Two High Skin-pass Mill
28"x60" Single Stand Two High
18"x60" Three High Roughing Mill, Complete with billet heating furnace and accessory equipment Incl. elecl. equip.

ROLL—TAPER FORGING
No. 00 Williams White Taper Forging Roll. Rolls 24" Dia., Shaft 8" Dia.

SAWS
No. 3 Ryerson Friction Saw, 54" Blade Hydraulic Feed, Complete with Elecl. Equip.
52" Ryerson Friction Saw, 45 H.P. Motor, Capacity Approx. 9" Round, 20" I-beam, 12" H-beam

SHEAR—ALLIGATOR
No. 7 Thomas Carlin Alligator Shear, 16" Blade 30 H.P., D.C. Motor

SHEARS—ANGLE
Hilles & Jones No. 2 Double Angle Shear, M.D. Capacity 6" x 6" x ⅝"
Long & Allstatter Double Angle Shear, Model B Capacity 6x6x⅝". Complete with Elecl. Equip.

SHEAR—BAR
No. LH Lewis Open End Bar Shear, Motor Drive. Capacity 1½" Round

SHEARS—ROTARY
No. 60 Quickwork Rotary Shear, ⅜" Capacity
No. 100 Kling Rotary Shear, 1" Capacity
No. 30 Quickwork Rotary Shear 5/16" Capacity
Quickwork Heavy Duty Circle Shear ⅜" Capacity. Complete with Circle Cutting Attachment
No. 25A Quickwork Whiting Rotary Shear ¼" Capacity, with Circle Cutting Attachment, Motor Driven

SHEARS—SQUARING
12'x3/16" Stamco Steel Squaring Shear, Motor Dr.
8' x ¼" Drabert Model THZ 6/2500
6' x ¼" Long & Allstatter, Belted Motor Drive

SLITTERS
31" Yoder Sheet Slitter No. 530, Capacity 3 cuts .194" to 8 Cuts .156", Motor Dr.
72" Yoder Gang Slitter, Capacity 5 Cuts 20 Ga.

STRAIGHTENERS
No. 3 Medart 3-Roll Straightening Machine Capacity 1" to 3½" bars or 4½" O.D. Pipe or Tubing. NEW 1950
No. 1½B Sutton Round Straightener, Motor Dr. Capacity Tubing 5/16" to 2⅞"—modified to handle up to 3½" O.D. tubing
No. 1B Sutton Round Straightener, Motor Drive Capacity 3/16" to ¾" O.D. Friction Drive complete with 1/3 H.P. A.C. Motor
Haliden 8-Roll Strip Straightener & Cutting Machine, Capacity 14" wide 11 Ga. Sheet Steel

STRETCHER
McKay Hydraulic Bar Stretcher. Capacity up to 1¾" dia. in length 12' to 27'

SWAGING MACHINES
No. E4 Langelier. Capacity 1½" Tubing
No. 408 Etna Swager, Capacity 4" Tubing

TESTING MACHINES
300,000# Southwark Emery Universal Hydraulic
20,000 lb. Southwark Emery Universal Hydraulic

WELDERS
250 KVA Progressive Model A-6 Flash Welder 440 volt 60 cycle. Mechanical Contactor Hi-Pressure Clamp Assembly—NEW 1949
McKay Tube or Pipe Welding Unit, Capacity 4⅝" to 7½" O.D. Complete with all accessory equipment and motors

WIRE DRAWING MACHINE
No. 0 Waterbury Farrel 7-Die Wire Drawing Machine. Capacity ¼" rod to #10 copper

• Manufacturing **RITTERBUSH & COMPANY, INC.** Equipment •

50 CHURCH ST., NEW YORK CITY 8

Telephone Cortlandt 7-3417

Confidential Certified Appraisals
Liquidations — Bona Fide Auction Sales Arranged

Consulting Engineering Service
Surplus Mfg. Equipment Inventories Purchased

THE CLEARING HOUSE

43rd YEAR —:— 43rd YEAR
MOTORS & GENERATORS, etc.
1 YEAR GUARANTEE

Partial Listing Only!

GENERATORS—250 V. D.C. Motor Driven

KW	Make	Type	Speed
1000	Al. Ch.		720
250	Cr. Wh.	CCD	1200
150	West.	SK	900
125	G.E. (2)	MPC	1200
100	Delco		1150
75	Cr. Wh.	51H	1150
50	Cr. Wh.	HH	1150
40	West.	SK	1750
35	G. E.	RC	1750
35	Al. Ch. (4)	3 wire	1750
25	G. E.	CS	1200
15	Star		1750
7½	West.	SK-43	1750
5	West.	SK-284	1750
5	Rel.	T-23T	1750
3	Rel.	T-14T	1740

GENERATORS—Low Voltage D.C.

Amp.	Make	Voltage
10,000	H-V-W	6
10,000	J-L	10
6000	El. Prod.	18/36
5000	H-V-W	6/12
4000	North.	7½
3000	Chandey.	12
2500	Chandey.	6/12
1500	H-V-W	6/12
750	H-V-W	6/12
1000	G. E.	15
1000	G. E.	25
1000	West.	24
100	Diehl	32
200	West.	35
200	Burke	35
125	Diehl	40
500	G. E.	32
1000	Chandey.	40
1500	Century	45
3200	G. E.	50
325	West.	50
1000	G. E.	75

230 V. D.C. MOTORS

H.P.	Make	Type	Speed
250/300	Rel.	2600T	400/800
200/130	Cr. Wh.	CMC-125H	450/900
187½	G. E.	MDS-418AR	435
150	West.	SK	1150
150	West.	SK	850
150	G. E.	LC	1750
125	Rel.	T	600
125/50	E. D.	20-SL	1750/1315
100	West. (6)	SK	1150
100	West. (6)	SK	850
100	Rel.	651-T	850
100	G. E.	RC	600
100	Rel.	1060-T	500
100	A-C		1150
100	FM	TRC-38	725
110/55	G. E.	DMC	800/400
90/45	G. E. (3)	RF-17	950/475
75	G. E.	CD-155	1150
75	West. (6)	SK	1150
75	G. E.	RC	1000
75	Rel.	461-T	850
75	West. (2)	SK	850
75	West.	SK	475
75	Cr. Wh.	CMC-125H	875/950
60	West.	SK	850
60	West.	SK-160	850
60	West.	SK	250/1000
50	Cr. Wh.	CMC-FH	1750
50	Cr. Wh.	CMC-CH	1150/1750
50	G. E.	CD-93	3600
50	West.	SK-160	565
50	G. E.	RF-17	250/1000
45	G. E. (3)	CD-105	850
40	Cr. Wh.	FH	1750
40	West. (5)	SK	775
40	Rel.	461T	400/1200
35	E-D	25S	350/1050
35	West.	SK	250/1050
35	West.	SK	1150

SLIPRING MOTORS

H.P.	Make	Type	Speed
600	Cr. Wh.	131-AQ	507
500	Elliott	EFKORE	1180
500	G. E. (2)	IM	450
400	G. E.	IEM-17B	870
250	G. E.	IM-17B	450
200	G. E.	MT-559Y	1175
150	G. E.	IM	870
125	West.	CW	1750
125	G. E.	IM	580
100	G. E.	MT-347	1150
100	G. E.	IM	690

SQUIRREL CAGE MOTORS

H.P.	Make	Type	Speed
250	GE (TENV)	K-6335	1750
200	Wagner	RP2-26Z	1800
200	West.		1750
200	A. Ch.	AR	885
200	G. E.	KF-6335	880
150	West.	CS	1175
150	G. E.	IK	580
125	A. Ch. (2)	53R	3500
125	A. Ch. (5)	AR	1800
125	Century		3500
125	A. Ch.		890
100	West.	CS407S	3540
100	G. E.	IEK	1800
100	West.	CS	870

Please Send Us Your Inquiries

L. J. LAND, INC.

Established 1910

150 GRAND STREET, NEW YORK 13, N. Y.

CAnal 6-6976

MILES' QUALITY

AIR COMPRESSOR, 21"x13"x16" Worthington
AUTOMATIC, 20"x25" Fay (1942)
AUTOMATIC, 8" Bullard Mult-Au-Matic, 6-spindle
AUTOMATIC, 6-spindle Baird chucker
BORING MILL, 4" Detrick & Harvey, horizontal, floor type
BORING MILL, 3" Universal tri-way, duplicator
BROACH, No. 1 Foote Burt duplex surface
BROACH, 2-ton American horizontal hydraulic
BROACH, No. 3XA Oilgear horizontal hydraulic
BROACH, V42 American hydraulic, 18 ton
BULLDOZER, No. 22 Williams & White
DRILL, Nos. 217, 310, 321 Baker
DRILL, No. 36 HO Baker hydraulic
DRILL, 24" Cincinnati upright
DRILL, 24" No. 25 Foote Burt
DRILL, 12-spindle No. 12 Natco
DRILL, 12-spindle No. 10 Defiance rail type
DRILL, No. B 250 H Natco multiple
DRILL, 36-spindle Baush. adjustable spindle
DRILL, RADIAL, 3½', 8" American sensitive
GEAR HOBBER, No. 12H G&E
GEAR HOBBER, No. 130 Cleveland Rigidhobber
GEAR HOBBER, No. 3 Adams Farwell
GEAR HOBBERS, No. 12 & Type A Barber Colman
GEAR HOBBERS, Nos. 1 and 25 5A Lees Bradner
GEAR SHAVER, 8"-12" Red Ring
GRINDERS CENTERLESS, Two No. 2 Cincinnati,
GRINDER, 6"x30" Cincinnati, type ER, infeed
GRINDERS, 10" x 18" & 10" x 36" Norton Semi-Auto
GRINDER, DISC. 30", No. B Badger
GRINDER, DISC. No. 228 Hanchett opposed
GRINDER, DISC. No. 84A Gardner opposed
GRINDER, Internal, Bryant Nos. 5, 16A, 16-28 & 24-36
GRINDERS, INTERNAL, Nos. 72A3 and 72A5 Heald
GRINDERS, SURFACE, 12" and 16" No. 22 Healds
GRINDER, SURFACE, No. 78 Wilmarth & Morman
HAMMER, Nos. 5N & 6B Nazel pneumatic
HAMMER, 40 lb. Bradley helve
HONE, Nos. 172 & 2610 Barnes hydraulic
LATHE, ENGINE, 24"x14' American
LATHE, ENGINE, 30"x16' LeBlond
LATHE, TURRET, No. 5 Acme universal
LATHE, TURRET, No. 5 Gisholt universal, 1943
LATHE, TURRET, No. 6 W&S, G. H, motor-in-base
MILLERS, Two No. 2 Cincinnati plain
MILLERS, Nos. 1, 2 and 3 Kent Owens hand
MILLER, 18" Cincinnati automatic
MILLER, 24" Cincinnati automatic duplex
MILLER, type 45 Product-O-Matic
MILLER, 30½" x 21" x 12" Ingersoll 4-spindle planer type
MILLER, 48" x 20" x 20' Ingersoll planer type, 3 vertical heads
MILLER, 48" x 36" x 12' Ingersoll planer type adj. rail
MILLER, 84" Ingersoll 6-spindle rotary continuous
MILLER, PLAIN, No. 3B Milwaukee
MILLER, THREAD, Type C Hall planetary
MILLER, THREAD, Nos. 4, 6 and CT 36 Lees Bradner
PLANER, 36"x36"x8' Cleveland openside
PLANER, 36"x36"x12' Niles Bement Pond
PRESSES, Nos. P01, P1, P2, P3, PA4, P5 and CA4 Ferracute
PRESS, No. 61 Cleveland OBI
PRESS, No. 6 Toledo OBI
PRESSES, Nos. 56 & 56½ Toledo
PRESS, No. 245½ Hamilton s.s. tierod frame
PRESS, No. EG54 Ferracute knuckle joint
PRESS, 600 ton No. 570 Toledo forging
PRESS, No. DA8411 Hamilton double actien toggle draw
PRESS, 100 ton HPM hydraulic
RIVETERS, large variety
ROLL, 20'x3/16" Farnham bending
SLOTTER, 16" Bement Miles crank
SAWS, Three 816S Kalamazoo metal cutting band
SAW, 7" No. 14 Higley cold-cutting
SAWS, three L-W (Toledo) power hack, new
SHAPER, 32" Ohio Dreadnaught
SHAPER, 27" Morton draw cut
SHEAR, 38" throat No. 17F New Duty
STRAIGHTENER, No. 0 Sutton for bars
TAPPERS, Two No. 71 Ettco
TAPPER, 19" Hammond sensitive drilling & tapping
TESTER, 230,000 inch-pound Tinius-Olsen No. 2 torsion
TESTER, 100,000 lb. Riehle tensile & compression
THREADERS, 2" Landis pipe threading and cutting
THREADERS, Two 3¼" Landis, double spindle
THREADERS, 2" Oster rotary head
UPSETTER, 3" National air clutch
UPSETTERS, Two 4" Ajax heavy duty, twin-gear
WELDER, 100 KVA Thompson automatic spot
WELDERS, 12" and 14", 12 KVA American Electric Fusion Co. spot.

WRITE FOR CATALOG NO. 193 FOR COMPLETE LISTING

MILES MACHINERY CO.

2025 E. Genesee Ave.

SAGINAW, MICHIGAN

RE-NU-BILT
GUARANTEED
ELECTRIC POWER EQUIPMENT

D.C. MOTORS

Qu.	H.P.	Make	Type	Volts	RPM
1	2200	G.E.	MCF	600	400/500
1	1750	Whse.		600	550/700
1	1500	Whse.		525	600
1	940	Whse.	QM	250	140/170
1	600	Al. Ch.		250	400/800
1	500	Whse.	CC-218	600	800/900
3	450	Whse.		550	415
1	400	G.E.	MCF	550	800/1050
1	350	Cr. Wh.	CCM-151H	230	1100
1	335	Whse.	MQ	250	300/900
1	300/300	G.E.	MPC	230	860/920
1	200	Rel.	1970T	230	720
1	150	G.E.		600	250/750
1	150	Cr. Wh.	65H	230	1150
10	150	Cr. Wh.	83H-TEFC	230	960
3	150	Whse.	SK151B	230	900/1800
1	150	Whse.	SK-201	230	860/950
1	50/120	G.E.	MCF	230	250/1000
3	100	Whse.	SK-181	230	450/1000
1	100	G.E.	CD-175	230	365/730
1	100	G.E.	CDP-115	230	1750

MILL & CRANE

1	50	G.E.	CO-1810	230	735
1	33	Whse.	K-8	230	585
2	20	G.E.	MD-104½AA	550	700
1	20	Whse.	K-5	230	975
4	15	Whse.	K-5	230	630
3	10	C.W.	SCM-AH	230	1150
1	10	G.E.	MD-104	230	400/800
3	8.25	Whse.	K-3	230	680
4	5	C.W.	SCM-FF	230	1750
2	3	Whse.	HK-2	230	885
1	2½	Whse.	K-1	230	885

A.C. MOTORS

3 phase—60 cycle

SLIP RING

Qu.	Hp.	Make	Type	Volts	Speed
1	1800	G.E.	MT-498	2300	360
1	1500	ABB		2300	720
1	1200	G.E.	MP	2300	375
1	500	Whse.	CW	550	350
1	500	G.E.	IM	440	900
2	500	G.E.	M-574-Y	6600	900
1	500	G.E.	IP	550	585
1	400	Whse.	CW	440	514
1	350	G.E.	MT-443Y	2300/4000	258
1	300	Al. Ch.		440	585
1	250	G.E.	MT-424-Y	4000	257
1	250	G.E.	MT-559S	2300	1800
1	250	Al. Ch.		550	600
1	200	Cr. Wh.	26QB	440	585
3	200	G.E.	IM17	550	585
3	200	G.E.	IM-17	440	880
1	200	G.E.	IM	440	435
1	200	G.E.	MTP	440	1170
1	150(unused)	Whse.	CW	2300	435
1	125	Al. Ch.		440	720
4	125	G.E.	MT-566Y	440/2200	435
2	100	G.E.	IM	440	900
5	100	A.C.	ANY	440	695
1	100	G.E.	IM-16	2200	435
1	100	Whse.	CW-868A	440	700

SQUIRREL CAGE

2	650	G.E.	FT-559BY	440	8570
2	450	Whse.	CS-1420	2300/4150	354
1	300	Al. Ch.		2200	585
1	200	G.E.	IK-17	440	580
1	200	G.E.	IK	440	885
3	200	G.E.	KT-557	440	1800
1	150	Whse.	CS-8548	440	880
1	150	Whse.	CS	440	580
1	150/75	G.E.	IK	440	900/450
3	125	Al. Ch.	ARW	2300	1750
1	125	G.E.	KF-6338-E	440/2200	3585
1	125	Whse.	MS	440	435

SYNCHRONOUS

2	8500	G.E.	TS	2300	257
2	2100	G.E.	ATI	2300	360
2	1750	G.E.	ATI	2300	3600
2	2000	Whse.		2300	130
3	735	G.E.	ATI	2300/13800	600
1	450	Whse.		2300	450
2	350	G.E.	TS	2300	150

M-G Sets — 3 Ph. 60 Cy.

Qu.	K.W.	Make	RPM	D.C. Volts	A.C. Volts
2	2000	G.E.	580	600	11000*
1	2000	G.E.	514	600	6600/13200
3	1500	G.E.	514	250	6600/13200
1	1500	G.E.	720	600	6600/13200
1	1500	G.E.	360	275	4400
1	1500	Whse.	600	600	4160
2	1000	Whse.	900	600	4160
1	1000	G.E.	900	280	6600
1	1000(SU)	G.E.	900	250	2300
1	750	Whse.	900	275	4160
1	500	G.E.	720	125	2300
1	500	Whse.	900	125/250	440
1	500	Whse.	900	250	6600/13200
1	500	Whse.	1200	125/250	2300
1	400	Whse.	1200	250	2300
1	400(SU)	Cr. Wh.	1200	125/250	2300
1	350	G.E.	900	125	2300/4160
1	300	Al. Ch.	1800	125/250	2300
1	150	Whse.	1200	275	2300
1	140(SU)	Cr. Wh.	900	125/250	440/2300
1	100	Delco	1200	120/240	2300
1	100	G.E.	1170	125	220/440

* 25 Cycle

FREQUENCY CHANGER SETS

Qu.	KW	Make	Freq.	Voltages
1	3000	G.E.	25/60	2300/2300/4000
2	2500	G.E.	25/62.5	2300/2300
1	1000	G.E.	25/58.3	4400/2300
1	500	Al. Ch.	2560	11000/2300

BELYEA COMPANY, INC.

47 Howell Street, Jersey City 6, N. J.

RAILROAD EQUIPMENT—FOR SALE

USED **AS IS** **RECONDITIONED**

STANDARD GAUGE FREIGHT CARS

Box, Double Sheathed, 50-Ton Capacity
Box, Single Sheathed, 50-Ton Capacity
Flats, 40 & 50-Ton, Steel Underframe, 40'0" long
Gondolas, Composite, 40-Ton Capacity
Gondolas, Composite or All-Steel, 50-Ton
Hoppers, Covered, All-Steel, 70-Ton
Hoppers, Twin, All-Steel, 50-Ton, Cross Dump
Hoppers, All-Steel, 70-Ton, Cross Dump
Tank, 3,000-Gallon, High Pressure
Tank, 8,000-Gallon, Coiled and Non-Coiled

EXTRA LONG FLAT CARS

40 & 50-Ton Capacity, Length 70' and 74'

CABOOSE CARS

Eight Wheel, Cupola Type

STANDARD GAUGE AIR DUMP CARS

Side Dump, 20-Yd., 40-Ton, Lift Door
End Dump, 20-Yd., 50-Ton, Drop Door
End Dump, 10-Yd., 30-Ton, Lift Door

OTHER EQUIPMENT

Locomotive Cranes
Overhead Cranes
Railroad Track Scales

STANDARD GAUGE DIESEL-ELECTRIC ROAD SWITCHING LOCOMOTIVE

1500 H.P., 120-Ton, Type 0-4-4-0

Send us your inquiries — *We Buy Freight Cars for Dismantling* — *Send us your offerings*

IRON & STEEL PRODUCTS, INC.

REPAIR PARTS For All Types of Freight Cars

General Office
13496 S. Brainard Ave.
Chicago 33, Illinois
Phone: BAyport 1-3456

New York Office
50-b Church Street
Phone: BEekman 3-8230
New York 7, N. Y.

STORAGE TANKS
6,000 Gallon
8,000 Gallon
10,000 Gallon

"ANYTHING containing IRON or STEEL"

Eastern Rebuilt Machine Tools

THE SIGN OF QUALITY—THE MARK OF DEPENDABILITY

RADIAL DRILLS
2½' Fosdick, gear box on base
4'-11" col. Cincinnati-Bickford, m.d., late
4'-13" col. Cincinnati-Bickford, Super-Service, m.d., late
8'-17" col. Dreses, gear box, m.d.
Zewo Precision Universal Bench Type Radials, m.d., new

BALL BEARING DRILLS
No. 15 Buffalo, floor model, m.d.
No. 18D Buffalo, floor model, m.d.
No. 18 Canedy-Otto, bench model, m.d.
Allen Bench Type, m.d., ½ H.P., 12" overhang
Mason Bench Type, Single Spindle, belt
Providence Engineering Co., Model E, s.p.d.
No. ½, 1, 2 Avey, belted m.d.
No. 1B Edlund, m.d., new
No. 4 Fosdick, 8" overhang, belted m.d., No. 2 Taper
1 spindle Allen, belt drive
2 spindle Allen, belted m.d., 8" overhang
2 spindle Avey, size No. 1 Type B, style VHP, m.d., 8" overhang
2 spindle No. 3 Avey, belted m.d., p.f.
2 spindle Leland & Gifford High Speed, 8" overhang, m.d.
No. 1LMS—3 spindle Leland & Gifford High Speed, late, m.d.
4 spindle Avey #1 High Speed, m.d., 7½" overhang, No. 2 M.T.
4 spindle No. 3 Avey, belted m.d., No. 3 Taper, 12" overhang
6 spindle Leland & Gifford No. 2 Taper, m.d. on each spindle
6 spindle No. 2B Edlund, m.d., No. 2 Taper
6 spindle No. 3 Avey, belted m.d.
6 spindle Henry & Wright, m.d., 15" overhang, No. 2 Taper

HORIZONTAL DRILLS
Natco 1 spindle Horizontal Hydraulic Hole Unit, m.d.
3 way Natco Horiz. Drill, consisting of 3 E13 Holeunits
No. ⅛Bx30" Pratt & Whitney 2 spindle Deep Hole Reaming Machine, m.d.
No. ⅛Bx50" Pratt & Whitney Gun Barrel Rifling Machine, m.d., latest
No. 1Bx74" Pratt & Whitney 2 spindle Deep Hole Reaming Machine, m.d., latest
No. 1½x105" Pratt & Whitney 2 spindle Deep Hole Drill, m.d., latest
No. 1½x105" Pratt & Whitney 2 spindle Gun Barrel Rifling Machine, m.d.
No. 1 Pratt & Whitney 2 spindle Deep Hole Drill, belted m.d.
No. 1½ Pratt & Whitney 2 spindle, m.d., older type
Special Horiz. Drilling Machine, Cinti. Bickford Head mounted horiz. on base

MULTIPLE SPINDLE DRILLS
C12 Natco, m.d., 10x16" head
C13 Natco, m.d., 12x18" head
No. 3 Baush, m.d., 16x30" head, 15 spindles
No. 3 Baush, m.d., 20x40" head, 15 spindles
No. 16 Foote-Burt Fixed Center, m.d.
3 spindle Rockford Gang, m.d.
3 spindle 24" Barnes All Geared Self-Oiling, m.d.
3 spindle 28" Cincinnati-Bickford Upright, m.d., No. 4 Morse Taper
4 spindle Niles-Bement-Pond, m.d., 12' rail, No. 5 Taper

UPRIGHT DRILLS
20" Barnes All Geared, m.d., tapper
21" Cincinnati, belted m.d.
24" Aurora, belted m.d.
25" Weigel, belt drive, tapper
26" Aurora, m.d., tapper
32" Aurora, belt drive
No. 2 Colburn Mfg. Type, belted m.d.
D6 Colburn, m.d., H.D.
No. 314 Baker, m.d.
No. 315 Baker, Heavy Duty, s.p.d.
No. 513 Baker, m.d.
32" Superior Drill
No. 4 Defiance Machine Co. Drill, m.d.

GEAR SHAPERS
No. 12 Fellows Gear Shaving Machine, m.d., late
No. 6 Fellows, belt drive
No. 7, 7A Fellows, m.d.
No. 18 Fellows Gear Finishing Machine, m.d.
No. 6I Fellows, belted m.d.
No. 6IA Fellows, m.d., latest type
No. 64S Fellows, m.d.
No. 615A Fellows, m.d., late type
No. 64A Fellows, m.d., latest
No. 64S Fellows, belt
No. 72 Fellows, m.d., latest
No. 75 Fellows, m.d.

GEAR GRINDING MACHINES
6x20" Fitchburg Hydraulic Spline & Gear Grinder, m.d.
9" Pratt & Whitney Hydraulic Spur, m.d.
10" Pratt & Whitney Hydraulic Spur & Helical
No. 2HS Lees-Bradner Spur & Helical, m.d.
No. 13LS Fellows Gear Lapper, m.d.
SG11 Gear Grinding Machine, m.d., latest

We carry an average stock of 2,000 machines in our 11 acre plant at Cincinnati. Visitors welcome at all times.

THE EASTERN MACHINERY COMPANY
1002 Tennessee Avenue, Cincinnati 29, Ohio
MElrose 1241
CABLE ADDRESS EMCO

THE CLEARING HOUSE

LAURENS late models

Selection from our Large Stock of Modern Machine Tools.

fully guaranteed

ENGINE AND PRODUCTION LATHES

★One 12" x 30" Centers MONARCH Model CK Toolmakers' Lathe, new in 1943, with chucks, collet chucks, taper, etc.
★One 14" x 54" centers MONARCH Tool Room Lathe, geared head, new 1939-40, taper attachment.
★One unused HEID 17" x 78" centers Heavy Duty Engine Lathe, new 1951, used for demonstration.
★One 30" x 14' bed AMERICAN TOOL WORKS Heavy Duty Engine Lathe, taper attachment.
★Seven No. 4 GISHOLT Second Operation Production Forming, Facing and Cut-Off Lathes, new in 1947-48, with front and rear slides, hydraulic chucking, spindle hole 4½".
★One 20" x 25" Fay Automatic Lathe, 1939-40.
★One Model U SENECA FALLS LO-SWING 14" x24" Automatic Lathe, new in 1940.

TURRET LATHES

★Two No. 4R LIBBY Universal Ram Type, with chucks and tooling, 2½" spindle hole.
★One Model No. 4H-8 LIBBY Heavy Duty Saddle Type Turret Lathe, new in 1940, 8½" hole thru spindle, 32" swing.
★One Model 1FU FOSTER "Fastermatic" Turret Type, like new, with much tooling, 1943.

VERTICAL TURRET LATHES

★One 36" BULLARD Spiral Drive Vertical Turret Lathe, new 1940
★One 42" BULLARD Spiral Drive Vertical Turret Lathe, new 1940

AUTOMATICS

★One Model A 9/16 CLEVELAND Single Spindle Automatic, new in 1943
★One Model A 1-1/16" CLEVELAND Single Spindle Automatic, new in 1940
★One Model B 1½" CLEVELAND Single Spindle Automatic, new 1943

MILLING MACHINES

★One Model 3VG High Speed REED PRENTICE Vertical Mill and Die Sinker, 1942, rebuilt
★One 4½" x 12" PRATT & WHITNEY Thread Milling Machine, late style.
★One 6" x 20" PRATT & WHITNEY Model C Thread Miller, 1940.
★One Model LT 6" x 36" LEES BRADNER Thread Miller

CYLINDRICAL GRINDERS

★One 10" x 18" NORTON Type "C" Plain Grinder, 1942; with mechanical table traverse.
★One 12" x 36" NORTON Type LC Universal Grinder, new 1941
★One 14" x 36" Type CD NORTON, plain, 1941
★One 14" x 48" CINCINNATI Self-Contained Plain Grinder, 1940, Filmatic bearings.

INTERNAL GRINDERS

★Several No. 5B, No. 16, No. 16A, No. 24-26 BRYANT Internal Grinders, 16", 22", 28", swing.
★One 72A3 HEALD Gage-Matic Internal Grinder
★Two 72A3 HEALD Electric Indicator Automatic Internal Grinders
★One 72A3 HEALD Size-Matic Internal Grinder
★Two No. 172 HEALD Hydraulic Internal Gap Grinders, new 1941-42, cross sliding and swivel workhead, swing in gap 40"

AND A LARGE VARIETY OF FINE TOOL ROOM AND PRODUCTION MACHINE TOOLS

Call REdwood 3500 today.

REBUILT BY CINCINNATI'S SKILLED MACHINE TOOL CRAFTSMEN

Tools
LAURENS BROS., INC.
Machine
2780 HIGHLAND AVE.
CINCINNATI 12, O.

GUARANTEED TOOLS

16"x78" SIDNEY Toolroom Lathe, chuck, taper, new 1947

60"x20' NILES-BEMENT-POND Geared Head Engine Lathe, rapid traverse

27"x12' MONARCH Geared Head Engine Lathe, taper attachment, AC-MD

24"x72" centers BOYE & EMMES Heavy Geared Head Engine, chuck, AC-MD

No. 28 FOSTER Geared Head Turret Lathe, rapid traverse, AC motors

No. 3L GISHOLT Turret Lathe, 6¼" hole in spindle, bar feed, chuck, tooling, new 1945

42" BULLARD New Era Type Vertical Turret Lathe, AC-MD

36" BULLARD Vertical Turret Lathe converted to Spiral Drive, AC-MD

1½" LANDIS Double Head Bolt Threader, with leadscrews, MD

No. 1 DOUGLAS Plain Horizontal Mill, table 8"x32", power feeds, motor in base, No. 40 taper, new 1942

No. 2 VAN NORMAN Plain Horizontal Mill, power rapid traverse, No. 50 taper, new 1942

No. 3-24 CINCINNATI Plain Hydromatic Mill

5-13" column CARLTON Radial Drill AC motor on arm, 15 to 1500 RPM

4' AMERICAN High Speed Sensitive Radial Drill 9" column, AC motor on arm

No. 914 W. F. & John BARNES Hydraulic Drill, No. 6 Morse taper, 15HP motor, new 1948

3 Spindle FOSDICK Drill Press, Individual AC motors for each spindle, 1942

No. 6 TOLEDO O.B.I. Press, 56 Tons

Brand New Model FH-4C01 DENNISON Hydraulic Presses, 4 Ton, 8" throat (3)

10"x24" NORTON Hydraulic Surface Grinder, 1942

25A HEALD Rotary Surface Grinder, 24" diameter, magnetic chuck

36" OHIO Dreadnaught Shaper, AC-MD

75 Ton HENRY & WRIGHT Double Crank Dieing Machine, roll feed & Scrap cutter

No. 22 MURCHEY Threader

No. 135 CLEVELAND Rigidhobbers

O'CONNELL MACHINERY CO.
Tel: BAiley 5800
1693 GENESEE ST. BUFFALO 11, N.Y.

#32 Lucas Precision Horizontal Boring Mill—Serial #32-18-21.
6' American Radial Drill—Serial #55592
#61A Fellows Gear Shaper—Serial #21252
#3 Gisholt Turret Lathe—Serial #2807-1
16" Gould & Eberhardt Shaper
#72A Heald Sizematic Internal Grinder—Serial #24498
60" Hanchett Face Grinder
Lodge & Shipley Lathe—Serial #29051
#2 Norton Tool & Cutter Grinder—Serial #3355
6D Potter & Johnston Automatic Chucker—Serial #70393
72" King Heavy Duty Vertical Boring Mill Serial No. Lot 38—#175
Rowbottom Cam Miller—Serial 135/49. Rebuilt & guaranteed
20" Knight Rotary Table

Hazard Brownell Machine Tools, Inc.
350 Waterman St. Providence 6, R. I

6000 Lb. Chambersburg double frame Steam Forging Hammer.
2000 Lb. Erie Steam Drop Hammer, late type.
Multiple Punch No. 30-A W. W. 600-tons.
Multiple Punch No. 6 Cleveland 750-tons.
Multiple Punch Size G. L. & A. 940-tons.
300 Ton Oil Geared High Speed 2-Column Hydraulic Press, Stroke 18", ram 27" x 23".
750 Ton Williams White Self-Contained Down Moving Hydraulic Press, Bed 36" x 42", practically new.
Nipple Threading Machines (3), New 1950, ½", 1¼", 2". Roller Pipe Cutter.
H. & J. Straightening Rolls ⅝" x 48".
Kane & Roach #24 Angle Bender, Capacity 6 x 6 x 1".
5" Ajax Upsetting & Forg. Machs. twin gears, twin flywheels, susp. slides.
National Upsetting & Forg. Machs. 2", 4".
Ajax and Acme Upsetting & Forg. Machs., not susp. slides, sizes from 1" up.
Williams White Horizontal Bender & Straightener, Capacity 15" beams.
W.W. Bulldozers, #22, #3, #4, #29 Speed; #29-U type, reversing clutch.
Chambersburg Board Drop Hammers, 800 lb., 1200 lb., 2000 lb., 3000 lb.
Niagara Shear, Capacity 3 ft. 3/16".
Nazel Air Forg. Hammer #6-B, 7" sq.
Bradley Hammers, Cushioned Helve, Upright & Compact.
Bar Shear #12 B. C. Buffalo 5" Rd.
Bar Shears, Open End., Table cost on Slant; also Guillotine 1½" to 3".
Knuckle Joint Press 200-ton, 6" str.; EG-54 Ferracute 400-ton.
600-ton R. D. Wood Incl. Hydr. Locomotive Wheel Press, 96" betw. bars.
#50-A Quickwork Whiting Rotary Shear ¾".

BOLT, NUT & RIVET MACHINERY, COLD HEADERS, THREAD ROLLERS, THREADING MACHINES, TAPERS, COLD BOLT TRIMMERS, SLOTTERS, HOT HEADERS AND TRIMMERS, COLD AND HOT PUNCH NUT MACHINES, POINTERS.

DONAHUE STEEL PRODUCTS CO.
1913 W. 74th Street, Chicago 36, Ill.

WORLD'S LARGEST STOCK
STAMPING PRESSES
BLISS • CLEARING • CLEVELAND
FERRACUTE • HAMILTON • L & J
NIAGARA • TOLEDO • V & O

SQUARING SHEARS • PRESS BRAKES
REBUILT *and* GUARANTEED

JOSEPH HYMAN & SONS
TIOGA, LIVINGSTON & ALMOND STS
PHILADELPHIA 34, PA. Phone REGENT 9-7727

MACHINE TOOLS

BORING MILLS
No. 0 G&L Horizontal Boring, Drilling and Milling Machine
Nos. 31 & 32 LUCAS Horizontal Boring, Drilling and Milling Machine
30" & 42" BULLARD Vertical Turret Lathe
100" BETTS Vertical Boring Mill

DRILLS
3'9" CINCINNATI BICKFORD High Speed Radial, '41
No. E5 NATCO Multiple Spindle Drill—Hyd. table, '42

GEAR EQUIPMENT
Nos. 64, 72 & 725A FELLOWS Gear Shapers
No. 12 FELLOWS Gear Shaver, 1943
No. 36BM GOULD & EBERHARDT Gear Rougher

GRINDERS
No. 5 B&S 3" x 12" Plain Grinder
6" x 18" CINCINNATI Plain Hyd. Cyl.—Filmatic
6" x 18" LANDIS Type C Plain Grinder
6" x 18" NORTON Vertical Spindle Surface Grinder
10" x 24" LANDIS Universal Grinder
10" x 72" LANDIS Type C Hyd. Pl. Grinder—'42
No. 104 RIVETT Internal-External Grinders
No. 73 HEALD Internal Centerless Grinders
No. 172 HEALD Internal Grinder

LATHES
12" x 54" MONARCH Toolmaker's Lathe
14" x 54" REED PRENTICE Geared Head Engine Lathe
16" x 30" LODGE & SHIPLEY Toolroom Lathe, '41
27" x 14' cc LEBLOND HD Engine Lathe, 42
30" x 16'' bed AMERICAN "High Duty" GH
36" x 19' bed AMERICAN HD Lathe
42" x 25' cc AMERICAN "Super Productive" GH Lathe—two carriages

MILLERS
Nos. 0-8 CINCINNATI Plain and Vertical Milling Machines
Nos. 1-8 & 1-14 KENT-OWENS M.D. Prod. Millers
Model MM-5 U.S. Multi-Miller
No. 2B&S Pl. Light Type Miller
No. 2M CINCINNATI Vertical Millers, 1941
18" CINCINNATI Mfg. Knee Type Milling Machines
4½ x 36" P&W Model C Thread Miller
36" x 36" x 16' INGERSOLL Planer Type Milling Machine—3 heads
36" x 36" x 12' INGERSOLL Planer Type Milling Machine—3 heads Late

AUTO. LATHES & TURRETS
No. 2B&S Wire Feed Hand Screw Machine
No. 2 W&S Geared Friction Hd. Turret Lathe
No. 3 J &L Ram Type Universal Turret Lathe
No. 1H5 LIBBY Heavy Duty Turret Lathe
No. 11 GISHOLT Saddle Type Turret Lathe, 1942
Nos. 4D & 6S POTTER & JOHNSTON Auto. Lathes

MISCELLANEOUS
15" BETTS Vertical Slotter
⅛B P&W 2-spindle Reaming Machine
4" TAYLOR & FENN Spline Miller
6" P&W Upright Shaving Machine
24"x24" 6' GRAY Double Housing Planer, 1941
36" MORTON Draw Cut Shapers, 1945

Wigglesworth Industrial Corp.
193 Bent Street, Cambridge 41, Mass.

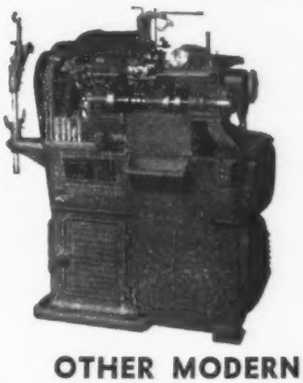
BORING MILL—84" (New)
BORING MILL—200" (New)
DRILLS, Radial—4', 5', 6', up (New)
FURNACE (2)—Tocco, Jr. 20KW, 2 Sta.
FURNACE—Roller Hearth, I.D. 15'8" x 3'6" x 11"
GUN BORING LATHE—64" x 65'0"
LATHE—32" x 21' c/c Bridgeford G.H.
MILLER VERT.—28" x 72" and 36" x 118" (New)
PRESS—2000 Ton, Knuckle Joint
PRESS—Plate Bending, 2000 Ton for forming cyl. shells, 14' W x 2½" Thick
PRESSES—Hydraulic, 1000-4000 Tons
PRESSES—Hyd. 100-2800 Tons for 105 mm shells
RIVET HAMMER—6B Hi-Speed
STRAIGHTENING PRESS—2000 Tons (Plate)
NUT-TAPPERS—¾", 6 Spindles (2)
UPSET & FORG. MACHINE—10"

MAXWELL MACHINERY CORP.
1775 Broadway New York 19, N. Y.
Plaza 7-3471

PRESS BRAKES
New 400 Ton
10' x 9/16" cap., 14' Overall
12' x 1/2" cap., 16' Overall
Delivery approx. 8 weeks
These are not foreign machines
INDUSTRIAL SALES CO.
1507 M St., N.W., Washington, D. C.
Chicago, Philadelphia, Baltimore & Greensboro, N. C.

SPECIALS OF THE WEEK

AUTOMATIC SCREW MACHINES



BROWN & SHARPE: (3) Model 2G, serial #8500 & 11500 series, 1¼" capacity.

BROWN & SHARPE: (10) Model OG, serial #9600 & 10700 series, ⅜" capacity

BROWN & SHARPE: (7) Model OOG, serial #14 to 16000 series, ⅜" capacity.

CLEVELAND: Model AA-11, 1⅜" serial #36586.

CLEVELAND: Model B, serial #42618/843, 1 1/16" capacity.

CONOMATIC: 4 Spindle, serial 2309FF, 1½" capacity.

NEW BRITAIN GRIDLEY: 61, 6 Spindle, serial #25410, 1⅝" capacity.

OTHER MODERN TOOLS IN STOCK

BORING MILLS: Bullard, Giddings & Lewis, New, 3" Capacity Horizontal

DRILLS & RADIALS: New Geared 24" Drills, 2" Capacity, New Radials 3½" x 12" Column

ENGRAVERS: Auto, Deckel, Gorton, Taylor & Hobson

GEAR EQUIPMENT: Barber Colman, Fellows, National Broach, Red Ring

GRINDERS, CUTTER, SURFACE, ETC.: Abrasive, Blanchard, Brown & Sharpe, Bryant, Cincinnati, Heald, Landis, Norton, Oliver Reed, Van Norman

LATHES: American, Hendey, Harding, LeBlond, Monarch, Pratt & Whitney, New 16" to 28" G. H. Gap

MILLS, PLAIN & UNIV.: B. & S., Milwaukee, Van Norman, New Univ. & Vert.

PRESSES: Bliss 5-48, Hamilton 800 Ton, Toledo

SHAPERS: Cincinnati 20", Rockford 24"

TURRET LATHES: Bardons & Oliver, Gisholt Nos. 2L, 5, Jones & Lamson No. 5, Preselector Bar Feed, Libby, 5" Capacity, Warner & Swasey, 1, 2, 4 Preselector

Pumps, Accumulators **HYDRAULIC EQUIPMENT** Injection Moulding Machines

Partial Listing*—HUNDREDS OF OTHERS—*Write for Catalog

AARON MACHINERY CO., Inc. Cable: AARMACH, N. Y.
45 CROSBY ST., NEW YORK 12, N. Y. Tel: WOrth 4-8233

COMPRESSORS

Stationary

CFM	LBS	MAKE	CMF	LBS	MAKE
28	150	Ingersoll	311	40	C.P.T.-Penn.
44	110	Ingersoll	368	100	I.R.-C.P.T.
64	50	Ingersoll	379	40	I.R.-Worth.
68	110	Penn.-Am.	386	115	I.R.
89	125	Worthington	460	125	Worth.
88	60	I.R.-Penn.	503	60	I.R.-Joy
93	100	C.P.T.-I.R.	568	100	I.R.-C.P.T.
122	100	I.R.-Worth.	594	20	I.R.-Worth.
153	40	Penn.-I.R.	740	40	Penn.-I.R.
161	60	I.R.-Am.	868	125	C.P.T.
166	135	I.R.-Am.	931	55	I.R.-Worth.
173	100	Am.-C.P.T.	1060	125	C.P.T.
187	40	C.P.T.-I.R.	1084	30	C.P.T.-I.R.
211	100	Worth.	1180	125	C.P.T.
217	70	Penn.-I.R.	1292	35	I.R.-Worth.
240	110	Penn.	1987	12	Worth.

TRADITION COUNTS
American Rebuilts Since 1902

Portables
30' Worthington
60' Worthington
85' Ingersoll-Rand
105' I.R.-Worth.
160' Worthington
210' Worthington
315' Worthington
500' Worthington
800' Worthington

HAVE YOUR COMPRESSOR REBUILT BY COMPRESSOR MEN
* * *
VACUUM PUMPS BOOSTERS

SELL • BUY • TRADE • RENT

AMERICAN AIR COMPRESSOR CORP.
DELL & 48TH STREET
NORTH BERGEN, N. J.
Telephone UNion 5-4848

BENDING ROLL

No. 9 H&J Shipyard "Strongback Roll"
Capacity 28 Ft. x 1¼"
75 H.P. 230 V. DC Motor & Controls

LANG MACHINERY COMPANY
28th St. & A.V.R.R. Pittsburgh 22, Pa.

LATE TYPE MACHINE TOOLS

Model RA-4 1⅜" Acme Gridley Automatic. Late Type.
HP-100 La Pointe Horizontal Hydraulic Broach. 1945.
3'11" Archdale Radial Drill. 1947.
No. 7 Gleason "Revex" Gear Rougher. 1943.
14" x 168" Norton Plain Type C Grinder. 1942.
24-36 Bryant Hydraulic Internal Grinder.
No. 72A3 Heald Plain Hydraulic Internal Grinder. 1941.
27" x 192" Niles "Timesaver" Engine Lathe. 1941.
27" x 120" Lodge & Shipley Engine Lathe. 1940.
No. 3FU Foster "Fastermatic" Platen Type Lathe. 1942.
No. H5 Libby Universal Saddle Type Turret Lathe. 1939.
No. 3R Gisholt Universal Saddle Type Turret Lathe. 1942.
No. 4R Gisholt Universal Saddle Type Turret Lathe. 1943.
8" x 84" Lo-Swing Semi-Automatic. 1941.
3A Sundstrand Copy Mill.
650 Ton Verson Double Action Eccentric Press. 1940.

Ask for Current Stock List

INDIANAPOLIS MACHINERY & SUPPLY CO.
1983 S. Meridian St.
INDIANAPOLIS 6, IND.

SINCE 1915
HEADQUARTERS FOR USED ROLLING MILLS AND STEEL WORKS EQUIPMENT

1—30" & 21" x 65" 3-high UNIVERSAL MILL, with 22" diam. vertical rolls, special pinion stand, front and back tilting tables.
1—ROUGHING UNIT (FOR STRIP OR PLATE) consisting of reversing SLABBING MILL and 3-high PLATE MILL.
1—SHEET ROUGHING MILL, 3-high, with roller and catcher tables.
3—8" x 12" UNITED COLD MILLS, 2-high, individual drives, combination pinion stands and gear reduction sets, coilers.
1—PLATE SHEAR, capacity 2¼" x 144", with 200 HP motor.
1—VERTICAL OPEN-SIDE BAR SHEAR, capacity 3½" round.
1—ROLLER LEVELLER, 17 rolls, 60" face, with motor drive.
1—STREINE SHEARING UNIT for automatically cutting sides and ends of sheets.
1—2000 HP MOTOR, 6600 volts, 3 phase, 60 cycle, 600 RPM.
1—1000 HP GEAR DRIVE, ratio 240 to 30 RPM.
1—TOP CHARGE MELTING FURNACE, 6 tons.

Typical: Export of 36" Reversing Blooming Mill complete with tables and accessories, including main drive motor.

SEND FOR EQUIPMENT LIST

FRANK B. FOSTER, INC. 2220 OLIVER BUILDING, PITTSBURGH 22, PA.
Cable: "Foster Pittsburgh" Telephone ATlantic 1-2780

GOOD USED and NEW MACHINE TOOLS IN STOCK

BULLARD 36" V.T.L. New Era, serial #8979, 15 HP Motor, Chuck Jaws .....$7500.00.
KING 50" Vertical Boring Mill, 2 heads on rail, reconditioned .....$4800.00.
ACME GRIDLEY Model R 4 Spindle 1⅜", serial #33067-4 with 10 boxes collets, tooling, parts, good condition .....$5000.00.
ACME GRIDLEY Model F 4 Spindle 1¾", serial #6462. New collets and feed fingers..$2000.00.
LIBBY Turret Lathe Model A, 18" x 3½" hole in spindle, serial #14717. 10 HP 8 spindle speeds, 16" 4-Jaw Universal Chuck .....$3000.00.
FAY Automatic 21" x 25", serial #6941.$2000.00.
NILES 30" x 30" x 8' Box Table Planer, 10 HP Motor, 1 head. Good condition .....$1800.00.
LODGE & SHIPLEY 36" x 12'10" Centers Lathe, serial #14037 with 15 HP Lima Drive..$3500.00.
HENDEY 16" x 6' Tie Bar Head Lathe T.A. serial #18066, new 4-speed Drive-All Unit, AC Motor, reconditioned .....$1600.00.

NEW GERMAN & BRITISH MACHINE TOOLS

SCHIESS Vertical Turret Lathe, 2 vertical heads, 1 side head, 87" turning dia. Available February, 1953.
SCHIESS Vertical Turret Lathe, 1 vertical head, 1 side head, 65" turning dia. Available December, 1952.
SCHIESS Vertical Turret Lathe, 1 vertical head, 1 side head, 41" turning dia. Available November, 1952.
ALFING High Speed Heavy Duty Drill Press, 25" swing, #3 Morse, 1600 RPM spindle speed .....$2600.00. In Stock
VICTORIA U1 Milling Machine $4450.00. In Stock
RICHMOND 4' Radial Drill Press $3750.00. In Stock
INVICTA Shapers, 14" .....$2000.00. In Stock
Swivel Vises 10½" Opening..$ 115.00. In Stock
Others.

GENERAL MACHINERY & EQUIPMENT CO.
140-44 S. 17th St. Harrisburg, Pa.

LATE TYPE MACHINERY

AUTOMATIC, 1¾"—4 Spin. Gridley Model G
BOLT THREADER, 2" Landis, 2 hds., M.D. (2)
BOLT THREADER, 1½" Reliance Williams
VERT. Attach. for Boring Mach. for 330T G. & L. Mill & Outer Support
BORING MACH., 3¼" bar Defiance Tble. Type
BORING MACHINE, 3½" Bar G. & L., Tble. Type
BORING MACHINE, 3" Bar Lucas, Table Type
BORING MILLS, 100" Cinci., Heavy, 2 Heads, M.D.
BORING MILL, 72" King, 2 Hds., M.D.
BORING MILL, 72" N.B.P., 2 Hds., M.D.
RADIAL DRILL TABLES, 36" x 20" x 20" (10)
RADIAL DRILL, 6' 15" col. Amer., M-on-Arm
RADIAL DRILL, 5' 15" col. Amer., M-on-Arm, Tri.
RADIAL DRILL, 5' 14" Col. Amer., M.D.
RADIAL DRILL, 5' Niles, No. 10, M-on-Arm, Late
RADIAL DRILL, 4' 11" Col. Cinci. Bick., M.D.
RADIAL DRILL, 4' Western, M.D. (2)
RADIAL DRILLS, 3' 8" & 2½' (New)
DRILL, 24" Cinci. Bick., Tapping
DRILL, No. D8 Colburn 36", 5" capty.
DRILL, No. 314 Baker, 24", 3" capty.
GEAR CUTTER, No. 13, B. & S. Spur & Bevel
GEAR SHAPERS, Nos. 6 & 75 Fellows
GEAR SHAPER, Nos. 61A, 64A & 64 Fellows, 1945
GRINDER, CYL., 4"x18" Landis #4H
GRINDERS, CYL., 16" x 48" Cinci., M.D.
GRINDER, SURFACE, 30" Blanchard, No. 16, M.D.
GRINDER, SURFACE, 14" P. & W. Vert. Spin. B.B.
GRINDER, UNIV., 12" x 36" Thompson, M.D.
GRINDER, Micro Int. M.D.
GRINDER, No. 6-T Sellers Tool, '42
KEYSEATER, No. 3½ Baker, 26" x 4" capty.
LATHE, 60" x 45' cen. Mackintosh-Hemphill, 1942
LATHE, 32" x 14' S. & S., M.D., T.A.
LATHE, 26"/48" x 24' Bed, McCabe, Dbl. Spin.
LATHES, 26"x12' Bridgeford QCG Grd. Hd., M.D.
LATHE, 25" x 12' Bed, B & E, T.A., Grd. Hd.
LATHE, 20" x 78" Matra, T.A., New
LATHE, 18" x 8' Bed, L. & S. Select Grd. Hd., M.D.
LATHE, TURRET, No. 3A W. & S., No. 699397
LATHE, 14" x 30" Cen. Monarch, M.D.
LATHE, GAP, 28"/50" x 16' Rahn Larmon, T.A., M.D.
TURRET LATHE, 21" Acme Univ., Brass, Late
TURRET LATHE, No. 1B Foster, Univ. 2" capty. (2)
TURRET LATHE, No. 2B Foster, Univ. 3¼" capty.
TURRET LATHE, No. 3 AL Gisholt, 6¼" H. S.
TURRET LATHE, No. 3 Gisholt, Bar & Chuck
THREAD MILLER, 12" x 60" Morey Shield, '43
MILLER, Abene (like Van Norman) New
MILLER, No. 000 B. & S. Plain, M.D. Late
MILLER, No. 0 Sundstrand Rigidmil Hand
MILLER, No. 2 Van Norman, Duplex, M.D.
MILLERS, No. 3 Cinci. Pl. Motorized
MILLER, No. 4 Cinci., High Power Universal
MILLER, No. 22L Van Norman Ram Type
MILLER, UNIV., Nos. 3 & 2 Cinci.
MILLER, UNIV., No. 1½ B Special K. & T. M.D.
MILLER, VERT., No. 5 Reed Prentice, '42
PIPE THREADER, 2" Landis A.C., M.D.
PLANER, FROG & SWITCH, 42" x 18" x 16' N.B.P.
PLANER, PLATE, 30" x 1" Cleveland, M.D.
PLANER, 36" x 36" x 14' Whitcomb, 2 Hds., M.D.
PRESS, Hydr., 200 Ton, Sectional Flanging
PRESS, No. 73½ Bliss S.S., 6" Stroke, 70 ton capty.
PRESS, No. 58, Toledo SS, Grd., 171 Ton capty.
SHAPER, 36" Morton Draw Cut
SHAPERS, 32", 20" & 16" Gould & Eberhardt
SHAPER, 24" Gemco "Kelly" Univ. Tble., '42

BENNETT MACHINERY CO.
375 Allwood Rd., Clifton, New Jersey
Phone: PRescott 9-8996 N. Y. Phone LOngacre 3-1222

PUNCH & SHEAR COMBINATION

HILLES & JONES #5, 24"/30" throat, ARR. MOTOR DRIVE.

S. M. DAVIS 510 LaSalle St. St. Louis 4, Mo.

IMMEDIATE DELIVERY
MACHINE TOOLING
FOR ALL STANDARD MACHINES
Our Ten Million Dollar Tool Crib serves Big and Little plants all over the nation. Everything Guaranteed!
We Buy Mfg. Plants Machine Shops, Big Tooling Inventories

U. S. INDUSTRIAL TOOLS
DEPT. I, 416 SOUTH CENTRAL AVENUE
LOS ANGELES 13, CALIF. • PHONE: MI 7891

10' BETTS
VERTICAL BORING MILL
AC MOTOR DRIVE
2 HEADS
CLARENCE J. O'BRIEN
1032 COMMERCIAL TRUST BLDG.
PHILADELPHIA 2, PA.

#26 Buffalo Forge Armour Plate Slitting Shear, 1¼" Round Cap. 10HP.
#1 Buffalo Forge Wrapping Rolls, M. D.
FALK MACHINERY COMPANY
18 Ward St. Baker 5887 Rochester 5, N. Y.

P. & W. 30" Two Spindle Profiler.
P. & W. 4½" x 36" Thread Mill, 1941.
Fellows #3M Worm Gear Red Liner.
Fellows Straight Line Generator
D. E. DONY MACHINERY CO.
47 Laurelton Road Rochester 9, N. Y.

Barber-Colman type A Model 12 Gear Hobber, 1943.
Cincinnati #2 Centerless Grinder, filmatic, 1943.
Reed model A21 Thread Roller, 1944.
Warner & Swasey #3 Turret Lathe, bar feed, 1942.
JOHNSON MACHINERY COMPANY
683 Frelinghuysen Avenue
Newark 5, New Jersey
Bigelow 8-2500

IT'S ARTCO FOR STEEL

(Most items do not require CMP — All for prompt shipment.)

OPEN HEARTH (SAE 1020) STEEL PLATES

3/16" x 60" x 120"
¼" x 72" x 240"
5/16" x 72" x 240"
⅜" x 72" x 240"
½" x 72" x 240"
9/16" x 60" x 240"
1" x 72" x 240"
1⅛"-6"—Various Sizes

WIDE FLANGE BEAMS

6" x 6" x 20# x 40'
8" x 8" x 31# x 40'
8" x 8" x 40# x 40'
10" x 10" x 49# x 40'
10" x 10" x 60# x 40'
12" x 12" x 65# x 40'

DEFORMED REINFORCING BARS

200 ton—⅝" x 40'—Mild

MILD H.R. SHEETS

11 gauge x 60" x 120"
12 gauge x 36" x 72"
14 gauge x 18" x 120" HRPO
24 gauge x 36" x 72"

MILD STEEL ANGLES

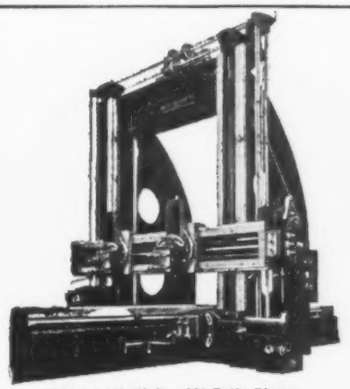
1¼" x 1¼" x 3/16" x 20'
1½" x 1½" x ¼" x 20'
2" x 2" x 3/16" x 20'

Many other sizes and gauges available in I Beams, H Beams, Angles, Channels, Flats, Rounds, Plates, Sheets, Strip, Oil Country Goods, etc.

50 CHURCH ST.
NEW YORK 7, N. Y.

ARTCO
INDUSTRIAL COMPANY, INC.

TEL: WOrth 4-3384
CABLE: "ARTCOINDUS"



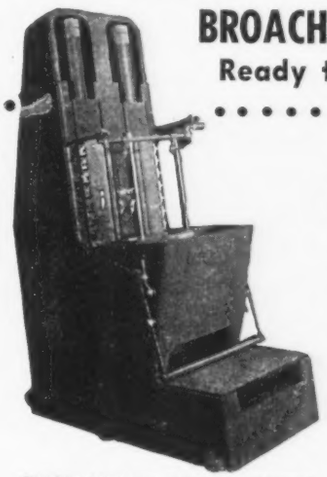
96" x 120" High x 20' Betts Planer. Rapid Trav. Rev. Mo. Dr.

60" x 60" x 18' Bethlehem (D & H) Openside Planer Box Table, Power Rapid Trav., Forced Feed. Lub. Rev. Mo. Dr.

100" Cinn. "Massive Type" Vert. Boring Mill Mo. Dr.
72"x72"x12' Sellers Planer, 3 Hds. Mo. Dr.
60" x 60" x 14' Pond Planer, 4 Hds. Box Table Rev. Mo. Dr.
60" Bement Engine Lathe 30' Centers, Taper Attchmt. (Raised to swing 84")

MACHINE TOOLS SALES COMPANY
36 S. Delaware Avenue Philadelphia 6, Pa.
Telephone: WA 2-1120

BROACHING MACHINES—Late Type
Ready to Operate in your plant



CINCINNATI No. 1-30 Hydrobroach

AMERICAN Type T-6-32 Vertical Hydraulic Broach; 3-way; stroke 32"; normal pulling cap. 12,000#; M.D.

COLONIAL No. VG1-10-48 Vert. "Pull-up" Hydraulic Broach; max. stroke of ram 48"; normal broaching force 10 tons; M.D.

OILGEAR X3XA horizontal Hydraulic Broach; max. length of stroke 56"; normal pulling cap. 20,000#.

CINCINNATI No. 1-30 Duplex Vertical Hydrobroach, model ER Max. stroke of ram—30". Normal broaching force 2000#; M.D.

WRITE, WIRE OR PHONE

MOREY ...for machine tools!

MOREY MACHINERY CO., Inc.
410 BROOME ST. • NEW YORK 13, N. Y.
Telephone CAnal 6-7400

BULLARD VERTICAL TURRET

42" swing, Serial No. 9500
New Era Type

POWER PRESS SPECIALISTS
471 N. Fifth St. Phila. 23, Penna.

KNOX
REBUILT
AIR COMPRESSORS
FULLY GUARANTEED
EARLE E. KNOX COMPANY
1111 BACON STREET ERIE, PA.

FOR SALE

1 Detroit Electric Furnace, type CC-600 K.W. 3000 lb. capacity. Two linings. Two shells. New. Original crate. No transformer.

Price.....$14,500.00

ADDRESS BOX S-835
Care *The Iron Age*, 100 E. 42nd St., New York 17

Immediately Available
ROLL FORMING MACHINES

Kane & Roach 15 stand, 30" wide, 4½" dia. shaft 75 H.P. M.D.
Yoder 14" stand, 24" wide, 2½" dia. shaft, 25 H.P. M.D.
Tishkin M-2 Ten stand Yoder with AC-2 Cutoff
Rafter Tube Forming Machines, 5 & 7 Stand
Yoder 5 stand vertical, with AC-1 Cutoff

PARTIAL STOCK LISTING

"The most diversified stock of machinery in the country. If it's machinery we have it."

National Machinery Exchange
128 Mott Street New York 13, N. Y.
CAnal 6-2470

THE CLEARING HOUSE

FOR SALE

We can make immediate delivery from our warehouse of HOT WORK DIE STEEL—TOOL STEEL — SPECIAL STEELS. All standard recognized brand names — guaranteed quality!!

HOT WORK DIE ROUNDS

SIZE	TRADE NAME	WEIGHT
7"	Pressuredie #3	77100#
5¼"	Hot Form	48900#
5¼"	#883 Carpenter	2875#
5 3/16"	"HWD"	33600#
4½"	Pressuredie #2	4658#
4¼"	"Shell Die"	16250#
4¼"	"HWD"	9000#
4⅛"	"Shell Die"	2400#
4"	Pressuredie #2	9000#
4"	"LPD"	5800#
4"	"Chro-Mow"	3100#
4"	"H.W.D."	445#
4"	Pressuredie #2	455#
3⅝"	"Shell Die"	4296#
3½"	"Chro-Mow"	28577#
3½"	"TCM"	35200#
3½"	"LPD"	20000#
3½"	"DC-33" Kloster	13700#
3½"	"Hot Form"	13100#
3½"	Pressuredie #2	11700#
3½"	"Shell Die"	8728#
3½"	"Air Kool"	1293#
3½"	"Fire Die"	1190#
2⅝"	"TCM"	1260#

HOT WORK DIE SQUARE

8½" x 8½" x 84"	Halcomb #218	40000#

TOOL STEEL (WATER H.) ROUNDS

SIZE	TRADE NAME	WEIGHT
5¾"	"CFS"	17700#
5½"	SAE 1095	2800#
5¼"	SAE 1095	1290#
4½"	SAE 1095	328#
4¼"	"CFS"	6093#
3¾"	SAE 1095	385#
2¼"	SAE 1095	270#
2 1/16"	SAE 1095	5700#
2"	Vulcan Spec.	8735#
1 15/16"	SAE 1095	140#
1⅞"	SAE 1095	3100#
1 11/16"	SAE 1095	20000#
.655"	SAE 1095-CD	28500#

TOOL STEEL (OIL H.) ROUNDS

6¼"	"Ketos"	12900#
4⅛"	CRU.DBL/Spec.	14690#
4"	"Vibro"	37300#
3"	"K.W." Carpenter	24000#
1⅝"	CRU.DBL/Spec.	2140#
⅞"	"SKF" 711	13400#
7/16"	"SKF" 711	1900#

OIL HARD. SQ. & RECT.

1¾" x 2" x 120"	"SKF 711"	6300#
1¾" x 1¾" x 120"	"Atlas 93"	10300#

WATER HARD RECT.

1¾" x 1" x 120"	"Silver Star"	33000#
1½" x 1" x 120"	"Columbia"	1700#

SPECIAL!! "Magic" Chisel Steel (Jessop)—9/16" RD.—C.D.—45000#

NOTE: We have large stocks of SAE 1095 (H.R.) Tool Shank Steel in Squares & Rectangles.

GLOBE TRADING COMPANY

1815 FRANKLIN ST. All Phones WO. 1-8277 DETROIT (7), MICHIGAN

FOR SALE

Freight car repair parts
Relaying rails
Steel storage tanks
Freight cars and Locomotives

Also

Contracting Equipment
Cranes—Tractors
Ditchers—Compressors
Diesel Engines
and Generating Sets

THE PURDY COMPANY

8754 S. Dobson Ave.
Chicago 19, Illinois

Empire State Bldg.
New York 1, N. Y.

FOR SALE

PRICES BELOW OPS CEILING
FREE of CMP . . . PRIME MILD

• STEEL PLATES •

Open Hearth Commercial, Shipbuilding & Boiler Quality—5/16" to 1" thick

• LOCOMOTIVES •

Switching Engines — Excellent Condition
25-TON PLYMOUTH, STD. GA., MODEL RXIS
12-ton Climax-Plymouth, Std. Ga., Model R-6-U

• RELAYING RAILS •

425 TONS—130#
ALSO 100 TONS TIE PLATES AND ANGLE BARS FOR 70-75# RAILS

NATIONAL METAL & STEEL CORP.

Dept. 1A, Terminal Island (Los Angeles Harbor), Calif.
Phone: NEVADA 6-2517

EST. 1904

DAVIDSON PIPE COMPANY INC.

ONE OF THE LARGEST STOCKS IN THE EAST

Seamless and Welded ⅛" to 26" O.D
All wall thickness Manufactured.
Specialty large sizes.
Cutting — Threading — Flanging — Fittings — Valves.

Call GEdney 9-8300
50th St. & 2nd Ave., B'klyn 32, N.Y.

---

150 HP REDUCTION GEAR

150 HP, ratio 11.7:1, Fawcus HBDR2. Dble. reduction. H.S. Shaft 4" dia., L.S. shaft 6¼" dia., Heavy duty, totally enclosed, herringbone.

F. H. CRAWFORD & COMPANY, INC.
30 Church Street New York 7, N. Y.

WE BUY AND SELL USED OVERHEAD TRAVELING CRANES STRUCTURAL BUILDINGS

Your Offerings and Inquiries Solicited

BENKART STEEL & SUPPLY CO.
CORAOPOLIS, PA.

ELECTRIC FURNACE to 1850°

8 x 12 x 15 Inside with Auto. Temperature Control 4.5 K.W. Sliding door, cheap to operate. Substantial, Dependable for Machine Shop—Tool Room. New. $280.

E. H. WILLIAMS, Box 9042
Huntington, W. Va.

FOR SALE

5000 FT. MORE OR LESS
4½" OUTSIDE DIAMETER
TYPE 347—14 GAUGE
STAINLESS STEEL TUBES

KLEIN FILTER & MFG. CO.

1225 SCHOOL ST., CHICAGO

FOR SALE

Round Steel Stapling Wire.
Standard Coils, Barrel Packed.

8 tons 18 Gauge	10 tons 20 Gauge
4 tons 19 Gauge	10 tons 22 Gauge

AMERICAN STEEL EXPORT CO., INC.
347 Madison Ave. New York 17, N. Y.
Tel.: MU 6-2100

FOR SALE

1948 Invoice Price

Unused 90 inch Cupola, Skip Hoist Charger, Blower with Automatic controls all in original container. Purchased as a unit.

UNITED STATES STOVE CO.
South Pittsburg, Tennessee

OFFERING

BRIDGE CRANES

ARNOLD HUGHES COMPANY
765 Penobscot Bldg. Detroit, Mich.
WOodward 1-1894

PIPE

VALVES and FITTINGS
All Sizes in Stock
NEW—USED

GREENPOINT IRON & PIPE CO., INC.
Bogart, Stagg & Meadow Sts. Brooklyn, N.Y.

BEARINGS

BALL BEARINGS • ROLLER BEARINGS
ALL SIZES — ALL TYPES
WRITE OR WIRE YOUR NEEDS

NEERUP INDUSTRIAL EQUIPMENT
2137½ SOUTH WABASH AVENUE, CHICAGO 16

FLANGERS, ¾" & ½" McCabe (2)
RADIAL DRILL, 5' 15" Col. Amer. Tri. Purp., M.
RADIAL DRILL, 3' 14" Col. Amer. Tri. Purp., Gear
RADIAL DRILL, 3½' Morris, 9½" col.
LATHE, GAP, 28/50" x 16' Rahn Larmon M.D.
LATHE, 48" x 20' Bed Amer., T.A., M.D.
LATHE, 14" x 6' Bed Amer., 18½" Sw., T.A., M.D.
SLOTTER, 20" Bement Miles, M.D.

LETCHER W. BENNETT & SONS
P. O. Box 544 CLIFTON, N. J.
PHONE—PRESCOTT 9-8998

LIFTING MAGNETS

A complete magnet service. Magnets, new & rebuilt, generators, controllers, reels, etc.

Magnet specialists since 1910

Goodman Electric Machinery Co.
1060 Broad St. Newark 2, N. J.

MOTORS – M. G. SETS – TRANSFORMERS

ENGINEERED AND REBUILT BY SPECIALISTS IN OUR MODERN PLANT

CRANE AND MILL MOTORS—230-VDC

Qu	HP	Make	Type	RPM
1	285/200 (Spare armature & anti-friction bearings for above motor)	G. E.	MDP-420	350/410
1	150/200	Whse.	MCB-100	370/300
1	150	Whse.	MT-5	350
1	100/140	Whse.	MCB-90	500/415
4*	100/140	G. E.	MDA-108	430/500
3	100/130	G. E.	CO-1831	675/400
2	85/65	Whse.	K-10	635/790
1	75/60	Whse.	K-10	425/470
1*	75/100	Whse.	CK-10	500/675
5	70/90	Whse.	MCA-70	440/400
2	70/90	Whse.	MCB-70	440/400
1	50/80	C. W	FW	375/480
1	50	G. E.	CO-1829	750
1	50/65	Whse.	MCLA-121	500/450
2	50/65	Whse.	MCA-60	475/425
1	50	G. E.	CO-1810	725
1	65/85	G. E.	CO-1836	700/650
1	65/85	G. E.	CO-1811	600/500
4	45/57	Whse.	K-9	515/470
1	45/57	Whse.	KG-9	515/470
2	35/45	G. E.	CO-1810	500/450
1*	35	G. E.	MDA-104¼	850
1	30	C. W.	FH	750
1	25/35	G. E.	CO-1828	750/450
1	27½	Whse.	K-6	1050
3	25/31	G. E.	MDS-408	575/500
1	23/30	G. E.	MDP-408	600/415
5*	20/28	Whse.	MCA-48	600/470
4	19/15	Whse.	K-5	630/560
3	16/19	C. W.	BW	620/560
1	16/13	G. E.	MDS-406	615/700
1	15	G. E.	CO-2505	700
1	15/19	G. E.	CO-1807	600/525
1*	13/17	G. E.	MDA -103	645/725
1*	13/17	G. E.	MDB-103	645/725

All motors series wound except those marked (*) which are compound; can furnish these for series operation.

SYNCHRONOUS MOTORS
3-Phase—60-Cycle

Qu	HP	Make	P.F.	Volts	RPM
1	6000	G. E.	100	2300	90
1	4350	C-W	100	13,200/6600	514
1	3000	Whse	80	4800/2400	720
2	2100	G. E.	100	2300	360
2	1750	G. E.	100	2300	3600
1	1000	El. Mchy.	100	440	1200
1	750	G. E.	80	2300	450
1	700	G. E.	80	2300	720
1	250	G. E.	100	2300	514

With these we can supply—manual, semi or full magnetic, full or reduced voltage control.

Motor Generators of modern design, complete with control—still on their original foundations—available for immediate shipment.
(3)—G.E. 1500-KW, 250-VDC, 514 R.P.M., cpd., interpole, pole face windings, 2100-HP syn. motors, .8-PF, 13,200-V, 3-p, 60-cy, will reconnect to 6600 V. or 4160-V.

SLIP RING MOTORS—CONSTANT DUTY
3-Phase—60-Cycle

Qu	HP	Make	Type	Volts	RPM
1**	1800	G.E.	MT-498	2300	357
1**	1200	G.E.	MT-26	2200	277
2**	1000	Al. Ch	ANY	2200	295
1	800	G.E.	MT	2200	448
1**	600	G.E.	MT-20	2200	360
2	500	G.E.	L-16-M	2300	450
1**	400	Al. Ch	ANY	2200	514
2	400	G.E.	MT-412	2200	450
1	250	Whse.	CW-937	440	1200

From our stock we can furnish manual and magnetic primary and secondary controls up to 3500-HP.

MOTOR GENERATOR SETS

Qu	KW	Make	RPM	Volts DC	Volts AC
1(3-U)	2400	Whse.	720	600	2400/4800
3	1000	Whse.	514	600	11000/6600
4	1000	G.E.	514	600	11000/6600
1	1000	G.E.	514	600	2300
1	500	C.W.	720	275	2300/440
1(3-U)	500	Whse.	1200	250	440
2	500	C.W.	720	275	2300/440
2	250	Whse.	1200	125/250	2300
1	200	Ridgway	900	275	2300
1	155	G.E.	720	250	2300/440
2	150	Whse.	1200	250	2300

We can furnish any of these sets with exciters and VARIABLE VOLTAGE CONTROL engineered and rebuilt to your requirements.

ELECTRIC TRAVELING GANTRY CRANE

10-ton Champion 100' span between ground rails, 31' overhang one end, 23'9" other end, 45' lift, with 1200' of 100# rail. Now 550-VAC, will arrange for 220/440-VAC or 230-V.D.C. AVAILABLE FOR IMMEDIATE INSPECTION AND SHIPMENT. In excellent condition. The kind of crane that is seldom on the market.

T. B. MAC CABE COMPANY

4302 CLARISSA STREET — PHILADELPHIA 40, PENNA.

CABLE ADDRESS "MACSTEEL" PHILADELPHIA, PA. — PHONE DAVENPORT 4-8300

SALE OR RENT

1—D6 Front-end loader
1—TD-9 Front-end loader, 1950
1—25-Ton Link Belt HC-90 Truck Crane 120' Boom
1—20-Ton Lorain 414 Truck Crane
1—2 Yd. Koehring 803 Crane
1—855 P. & H. Dragline
1—35 Ton Davenport Diesel Electric Loco.
2—No. 6 and 80-D Northwest Shovels.
1—10-Ton Link Belt Model 55 Wagon Crane Pneumatic Tire mounted
1—Northwest 25 Shovel Attachment
1—10-Ton Stiff Leg Derrick
1—40-Ton Orton Diesel Loco. Crane
1—40-Ton Industrial Brownhoist Oil Fired Loco. Crane. New 1943.

B. M. WEISS CO.
Girard Trust Co. Bldg., Phila. 2, Pa.
Rittenhouse 6-2311

3—10-ton Shaw Overhead Cranes, 67' 1" span, 230 VDC, box girders, structural end trucks, cage type Shaw motors and control, mechanical and electrical brake on hoist — heavy type — good condition — stored inside — ready to ship. PRICE f.o.b. Pittsburgh, Pa.
$9,500.00 each

SEND ME YOUR CRANE INQUIRIES — 200 other cranes, various tonnages, spans and current.

JAMES P. ARMEL — Crane Specialist
710 House Bldg. Pittsburgh, Pa.
Telephone: Grant 1-4449

1—10,000# Fairbanks Morse Crane Scales, dial type.
1—2500 HP, G.E. Motor, DC, 600 volt, 200/400 RPM
1—1200 HP Westinghouse Motor, 2200 V. 3/60/505 RPM, wound rotor.
1—Box type Annealing Furnace, Lee Wilson, 240" high x 103" high x 90" wide, direct firing, gas fuel, Brown Instruments, 3 bases included.

Lou F. Kinderman
Box 182 - Niles, Ohio - Phone 2-2589

FOR SALE

2—MARCHKE Heavy Duty Snag Grinders, 2-24 x 3" wheels, 20 HP, 230 Volt, D.C., RPM 1438 to 2307.

UNIVERSAL MACHINERY & EQUIPMENT CO.
320 East Broad Street Shillington, Penna.

FOR SALE

40-ton capacity Orton Model 40 Diesel Locomotive Crane, Built 1942. Cat. D17000 Engine. 65 Foot Boom. Excellent.
65-ton Whitcomb Diesel Electric Loco. Class 0-4-4-0, 580 HP. New 1944.
44-ton Gen. Elec. Diesel Electric Loco. New 1945. Class 0-4-4-0. 380 HP
14 Western 30 cu. yd. Side Dump Air Dump Cars. All Steel Drop Door and Lift Door Type.

MISSISSIPPI VALLEY EQUIPMENT CO.
501 Locust St. St. Louis 1, Mo.

RAILROAD CARS

NEW — REBUILT — USED
Box • Flat • Gondola
Hopper and Tank
LOCOMOTIVES
Diesel • Gas • Steam
GOOD USED R.R. CAR REPAIR PARTS

RAIL & INDUSTRIAL EQUIPMENT CO., Inc.
30 CHURCH ST., NEW YORK 7, N. Y.
R. R. SHOP AND YARD: LANDISVILLE, PA.

No. 0 MEDART straightening, sizing, and polishing machine for sale. Bought new March 1952. Can be inspected under power. $7550.

ADDRESS BOX S-895
Care *The Iron Age*, 100 E. 42nd St., New York 17

LOCOMOTIVE CRANES
40 ton Browning Diesel — 30 ton Industrial Diesel
40 ton Orton Diesel — 15 ton Browning Gas
20 ton Orton Gas
LOCOMOTIVES
16 ton Whitcomb S/G $2,500.00
78 ton Fireless — 8 ton to 65 ton Diesel
GANTRY CRANES, DERRICKS, 55" Magnets
STONE, THE CRANE MAN
1132 Prudential Bldg. Buffalo 2, N. Y.
Phone: Mohawk 4494

MOTORS, GENERATORS, TRANSFORMERS

1 — 1500 H.P.
Bought and Sold
New and Rebuilt
ELECTRIC EQUIPMENT CO.
ROCHESTER 1, N. Y.

CASH FOR SURPLUS

MACHINES FOR YOUR YARD
Hughes Keenan Roustabout crane
P&H 5 ton crawler crane
Butler fork lift truck
Butler Carscoop
Robins 20" belt tripper
3x12 revolving screen
TRACTOR & EQUIPMENT CO.
10006 Southwest Highway Oak Lawn, Ill.

THE CLEARING HOUSE

USED CONSTRUCTION EQUIPMENT

TRACTORS
GRADERS
CRANES
DRAGLINES

HYMAN-MICHAELS CO.
122 S. Michigan Ave., Chicago 3, Ill.

100# ARAA RAILS

500 tons 100# ARA Type A first class relaying rail with angle bars. Immediate shipment.

Also other sections 60# and up, spikes, bolts, frogs, switches, tieplates available.

M. K. FRANK
480 Lexington Ave., New York, N. Y.
401 Park Bldg., Pittsburgh, Pa.

RAILS *New and Relaying*

TRACK SUPPLIES · STRUCTURAL STEEL · RAILS

TRACK MATERIALS AND ACCESSORIES CARRIED IN STOCK

SWITCH MATERIAL ● SPIKES & BOLTS ● TRACK TOOLS ● TIES ● TIE PLATES ● BUMPERS ● COMPLETE SIDE TRACKS

BUILDERS STEEL SUPPLY CO.
4201 WYOMING • P.O. BOX 188 • DEARBORN, MICH.

EVERYTHING FOR THE TRACK FROM
SWITCH TO BUMPER

NEW & RELAY RAILS
in stock
12# THRU 130# SECTIONS
ACCESSORIES & SWITCH MATERIALS
INQUIRIES SERVICED PROMPTLY

MORRISON RAILWAY SUPPLY CORP.

RAND BLDG. BUFFALO 3, N.Y.
EMPIRE BLDG. BIRMINGHAM 3, ALA.

TANKS

10,000 Gallon R. R. tank car tanks

FREIGHT CARS
CAR PARTS, RAILS

●

Consolidated Ry. Equipment Co.
6702 So. Cicero Avenue, Chicago 38, Illinois

LOCOMOTIVES

4—100 TON G.E. DIESEL ELEC.
1— 65 TON G.E. DIESEL ELEC.
1— 65 TON WHITCOMB DIESEL ELEC.
1— 20 TON WHITCOMB GAS

DARIEN CORP., 60 E. 42nd St., N. Y. 17, N. Y.

New **RAILS** *Relaying*
Railway Track Accessories
STANDARD IRON & STEEL CO.
Office & Yards: Knoxville, Tennessee

EQUIPMENT AND MATERIALS WANTED

WEISS STEEL CO. INC.
600 WEST JACKSON BLVD.
CHICAGO 6, ILLINOIS
Buyers of Surplus Steel Inventories
32 Years of Steel Service

WANTED
SURPLUS STEEL
WALLACK BROTHERS
7400 S. Damen Ave. Chicago 36, Illinois

FOR SALE
Good Used Equipment

Every type of machine available. Find the equipment you need in the
CLEARING HOUSE SECTION
of THE IRON AGE

WANTED
BRIDGE CRANES
ARNOLD HUGHES COMPANY
765 PENOBSCOT BLDG. DETROIT, MICH.
WOodward 1-1894

***Try the* WANTED SECTION**
***for* "Hard-to-Find" Materials**
or Equipment

BUSINESS
OPPORTUNITIES

Canadian Factory

For sale, half-mile from center in City of 15,000 on No. 2 Highway, 80 miles west of Toronto; Shops & Offices about 24,000 feet; 1¾ acres land; 80% Brick construction; 15% Concrete Block; 5% Frame; 75% Ground Floor; Niagara Power & Light; Steam Heat by Oil. Located on interswitching connection between C.P.R. & C.N.R. main lines. 70% Vacant, balance in 8 months.

Arthur Blashill - Woodstock, Ontario
Phone—1142J

SEALED PROPOSALS FOR THE PURCHASE OF NEW, UNUSED EXCESS MATERIAL BEING OFFERED FOR SALE BY PANAMA CANAL COMPANY will be received by the Superintendent of Storehouses, Panama Canal Company, Balboa, C. Z., until 10:30 A.M., December 5 on Circular #26 part I (Auger, woodboring bits, twist drills, hand tools); December 9 on Circular #26 part II (Expanders, files, punches); December 12 on Circular #26 part III (Hand and machine reamers); December 16 on Circular #26 part IV (Rules, sledges, tapes, taps, saws, wrenches. Blanks and information relative to these offerings may be obtained from Panama Canal Company, 24 State St., New York 4, N. Y.

FOR SALE

Well equipped modern machine shop Central Ohio location in favorable labor area. 100 machine tools, modern building under favorable lease with over 15,000 square feet of floor space, including well appointed offices. Good defense and peace time contracts. Reasonably priced.

ADDRESS BOX S-887
Care *The Iron Age*, 100 E. 42nd St., New York 17

Have you any factories or plant sites to sell? This space would place you in touch with interested parties, as over 100,000 men read

THE IRON AGE

OUR GOAL

is to help you fill your "D.O." contracts

Let *Craft* gain yardage for you with our 7 special Metal Fabrication services

Craft offers you experienced management—top flight engineering—a modern, fully equipped plant. Save time—save money on your D. O. CONTRACTS. Contact Craft for full information . . . phone, wire, or send blueprints for prompt estimate.

7 *Specialized Services in*

- STAMPINGS
- DEEP DRAWINGS
- SHEET METAL WORK
- ANNEALING
- PICKLING
- SPINNING
- WELDING

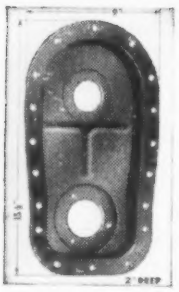
Craft MANUFACTURING CO.
3949 W. Schubert Ave. • Chicago 47, Ill.

Stainless Steel Specialists

CONTRACT MANUFACTURING DIRECTORY

The directory of production services. (This section appears in the first and third issues of each month.)

INDIANA



Put your stamping problems directly up to us by sending samples or drawings for prompt quotations! Complete modern facilities; sound financing; prompt delivery. High grade stampings in Steel, Aluminum Brass, Bronze, Copper, Zinc. Parts or complete assemblies produced to specification.

INDIANA PRESSED STEEL CO., INC.
400 S. Ohio Ave. — Phone 3-3364
MUNCIE, INDIANA

STAMPINGS

Nepsco

NEW ENGLAND PRESSED STEEL COMPANY

Contract Manufacturers since 1914

METAL STAMPINGS SPECIALTIES - APPLIANCES

For Industrial and Domestic Users

P. O. BOX 29
NATICK MASSACHUSETTS

DEEP HOLE DRILLING

Open time available on deep hole drillers. Straight drilled hole, all ferrous materials up to 35 Rc, length to 4 ft, hole from .200" to .500" O. D. not to exceed 3", and symmetrical shape.

Inquire

G. R. DOUGLAS
RIFLE BARREL MFG.
Rt. 3, Box 435, Charleston, West Va.

MACHINE TIME

New Acme-Gridley 6-spindle 8-inch chucking machine. 100 hours weekly available.

SUMMER & CO., 555 Buttles Ave., Columbus 8, Ohio

ALUMINUM

Industrial
STAMPINGS · DRAWINGS · SPINNINGS
Dies and Tools

SEND US YOUR SPECIFICATIONS
AMERICAN ALUMINUM WARE CO.
370 JELLIFF AVENUE NEWARK, N. J.

METAL STAMPINGS
WIRE FORMS
Just a few of the more than 7000 catalog items we manufacture.
What do YOU need?
EASTERN TOOL & MFG. COMPANY
General Office
BELLEVILLE 9 • NEW JERSEY

STAMPINGS

Light and Medium Electric Spot Welding and Assembled Units

We specialize in designing stampings to substitute castings. Dies designed and built for quantity production.

Eastern Tool & Stamping Co., Inc.
39 Ballard Street, Saugus, Mass.

SPECIAL MACHINERY

DIAMITE *Abrasive Resistant* Castings
NI-RESIST *Heat & Corrosion Resistant* Castings
P M G BRONZE *High Strength Acid Resistant* Castings
Fully Equipped—Pattern Foundry & Machine Shop Facilities—Castings to 15 tons.
Weatherly Foundry & Mfg. Co., Weatherly, Pa.

METAL STAMPINGS

LARGE FACILITIES

AREA LIMIT—36 SQ. IN. THICKNESS, 020 to 125. WILL BUILD TOOLS OR USE YOURS.

Send drawings or samples for prices.

J. H. SESSIONS & SON
290 RIVERSIDE AVE. BRISTOL, CONN.

Special Washers

We carry in stock Silicon killed Steel specially suited for case-hardening. Stock dies for producing washers from .0015 to ½" thick.

Thomas Smith Company
294 Grove St., Worcester, Mass.

Contract Machine Work

Parts and Complete Machines, Heat Treating and Grinding. Mail Blue Prints for Quotations.

GENERAL MACHINE WORKS
York, Pa.

OPEN TIME

In metal plant with the most modern equipment for fabricating Miscellaneous Items in all metals to either light or heavy assemblies. Quotations promptly furnished, send us your requirements.

NATIONAL BENT STEEL CORP.
53-01 Nurge Avenue Maspeth, L. I., N. Y.

. . . DON'T HIDE YOUR LIGHT UNDER A BUSHEL . . .

Have something new on the market or do you just want to tell why your product does the job better?

Either way, your advertisement in The Iron Age carries more weight and reaches more of your prospects.

NEED A MANUFACTURER FOR PRODUCTS OR PARTS?

See the

Contract Manufacturing Section

of the IRON AGE

1st and 3rd ISSUES of the MONTH ONLY

METAL STAMPINGS and STAMPING DIES

● Over 20 years of shop practice combined with designing and engineering skill enables us to create dependable dies for your intricate metal stampings. Let us produce your parts in large or small quantities.
● Send Us Your Blue Prints and Specifications.

THE H and P DIE and STAMPING CO.
13943 TRISKETT ROAD • CLEVELAND 11, OHIO

SWITCH

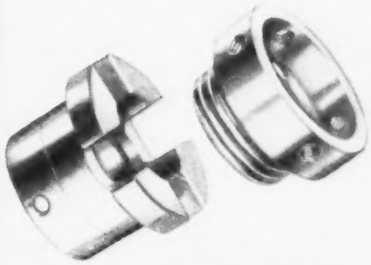
FROM CASTINGS LIKE THIS

TO NON-GRAN CENTRIFUGAL CASTINGS

● Eliminate Porosity! Improve Physical Properties! Request booklet. American Non-Gran Bronze Co., Berwyn, Pa.

PRECISION MACHINE WORK — NON-GRAN — CASTINGS—SAND & CENTRIFUGAL

OLSON for REAL SERVICE



Screw Machine Products

Made to your specifications and tolerances. From smallest up to 2⅝" diameter in steel, brass and aluminum.

OLSON MANUFACTURING CO.
100 Prescott Street, Worcester, Mass.

Intricate Assemblies Our Specialty

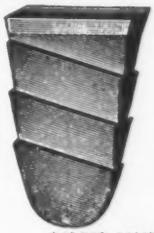
Over 60 years of precision manufacturing; Stamping, tools, dies, jigs, screw machine products.

100,000 sq. ft. floor space
Modern Equipment

"Greater Savings With Greist"

GREIST MFG. CO.
646 Blake Street New Haven, Connecticut

STAMPINGS-PUNCHINGS



WASHERS
made to your specifications

STA-FAST WEDGES
made of stamped steel
SELF-ALIGNING BELT FASTENERS — BOTH HAVE GREAT HOLDING POWER

SALING MANUFACTURING CO.
Standard Belt Fastener Div.
UNIONVILLE, CONN.

STEEL CASTINGS

OVER 35 YEARS EXPERIENCE
Steel Castings—5 to 15,000 lbs.
Careful Workmanship—Top Quality
Write for "Atlantic Axioms"

ASC QUALITY STEEL CASTINGS

The ATLANTIC STEEL CASTINGS COMPANY
Sixth and Lloyd Streets Chester, Pa.
Chester 3-4181

STAMPINGS

Steel—Brass—Aluminum
Fabricating
Assembly
Painting

Parts made to specifications

GGG METAL STAMPING CO., INC.
STARBRICK Station
Warren, Pa.

STAMPINGS — ASSEMBLIES

To drawing or sample

Drilling Forming
Blanking Tapping
Riveting Welding

DESIGN & DEVELOPMENT
Toolmaking of course

HUEBEL MFG. CO., INC.
763 Lexington Avenue
Kenilworth, N. J.

FORGINGS

Hammered Steel Forgings
UP TO 6,900 LBS. EACH

ALL TYPES
Smooth Forged — Finished — Rough Turned
Hollow Bored
and Heat Treated to Specifications
CRANKSHAFTS—SHAFTING
CONNECTING RODS
Roll—Gear Blanks—Pinions and Miscellaneous Forgings

BAY CITY FORGE CO.
ERIE, PA.
Over a Quarter of a Century of Dependable Service and Quality Products

DROP FORGE DIES

Forging Engineers—Die sinkers—Manufacturers of drop forge dies and hot work tools for presses and upsetters.

COMMERCIAL DIE COMPANY
7851 Intervale Ave., Detroit 4, Mich.
Phone: WEBSTER 3-7104 Cable Code "Comdie"

THREADED Rods

10 to 12 ft. Lengths
ALL METALS
Also special screw machine products to order
EASTERN MACHINE SCREW CORPORATION
New Haven, Conn.
Makers of H & G DIE HEADS

GRAY IRON CASTINGS

MACHINE TOOL CASTINGS—UP TO 20 TONS EACH

THE SESSIONS FOUNDRY CO.
81 W. Farmington Ave. Bristol, Connecticut
Telephone 4168

PLATE SHEARING

Capacity up to ⅜" x 12 feet
We will do your shearing
Economically — Efficiently

MORGAN STEEL CORP.
430 Morgan Ave. Brooklyn 22, N. Y.
Telephone—EVergreen 8-0202-3-4

DROP FORGINGS

Special Forgings of Every Description.
We solicit your prints or model for quotation.

Wilcox Forging Corporation
Mechanicsburg Penna.

FORGINGS — HY-GRADE

To your Blue Prints — Any Analysis Weldness Rings—Discs—Bars and Miscellaneous Forgings—Rough Turned or Heat Treated — Also Stainless Steels.

PATERSON STEEL & FORGE COMPANY
Stratford, Connecticut

Gray Iron and Semi Steel Castings, also alloyed with nickel, chrome, and molybdenum. Wood and Aluminum pattern work.

KING FOUNDRIES, INC.
Phone 825 North Wales, Montg. Co., Pa.
22 Miles from Philadelphia, Pennsylvania

EMPLOYMENT EXCHANGE

The meeting place for employers and men qualified for positions in the metalworking industry.

Help Wanted Rates
Employment Service Rates
Representatives Wanted Rates
Accounts Wanted Rates

Set Solid—50 words or less.....$10.00
Each additional word..... 25c
All capitals—50 words or less.....$16.00
Each additional word..... 32c
All capitals, leaded—50 words or less....$19.50
Each additional word..... 39c

Situation Wanted Rates
Payable in Advance
Set solid—25 words or less.....$2.50
Each additional word..... 10c
All capitals—25 words or less.....$3.75
Each additional word..... 15c
All capitals, leaded—25 words or less.....$5.00
Each additional word..... 20c

COUNT SEVEN WORDS FOR KEYED ADDRESS

EMPLOYMENT SERVICE

Immediate Openings for Metallurgists and Foundry Men

We now have positions available in practically all fields, including technical service and sales. Salaries range from $4,000 to $10,000. Openings in all sections of the country. Write or phone for full particulars. Your inquiry held in confidence.

EMPLOYERS SERVICE BUREAU
Phone: Financial 6-1155
6 N. Michigan Ave. Chicago 2, Ill.

HIGH GRADE MEN — Salaries $5,000 to $25,000. Since 1915 thousands of Manufacturing Executives, Engineers, Sales Managers, Comptrollers, Accountants and other men of equal calibre have used successfully our confidential service in presenting their qualifications to employers. We handle all negotiations. Submit record with inquiry. The National Business Bourse, 20 W. Jackson Blvd., Chicago 4.

HELP WANTED

ROLL TURNER

Wanted: Roll Turner, experienced on Bar Mill.

American Compressed Steel Corp.
900 E. Front St., Cincinnati 2, Ohio Main 3181

WANTED

Experienced salesmen to sell foreign steel sheet, plate, structural, bar and tubing to U. S. fabricators. Commission Basis. For American house representing foreign mills.

ADDRESS BOX S-864
Care *The Iron Age*, 100 E. 42nd St., New York 17

MAN WANTED

For Pittsburgh office of nationally known firm. Must be thoroughly experienced in selling Ferro-Alloys to consumers. Good salary and commissions. Give complete experience and references in first letter.

ADDRESS BOX S-886
Care *The Iron Age*, 100 E. 42nd St., New York 17

Topnotch Sales Executive and Salesman

with experience in the selling of strip steel and steel strapping needed by old, well-established producer and distributor. Salary and incentive. Give full details.

ADDRESS BOX S-891
Care *The Iron Age*, 100 E. 42nd St., New York 17

ASSISTANT METALLURGIST for ferrous metalworking plant. Address Box S-875, care *The Iron Age*, 100 E. 42nd St., New York 17.

HELP WANTED

METALLURGIST

Ferrous and non-ferrous. Must have five years well-rounded industrial experience, preferably aircraft, in metallography, heat treating, consultation and design considerations.

Starting salary commensurate with experience background. For more information about this position and our company, send resumé to:

Section N
Technical Placement Supervisor
McDONNELL AIRCRAFT CORPORATION
St. Louis 3, Missouri

INDUSTRIAL ENGINEER

WANTED BY SMALL ROLLING MILL. MUST BE EXPERIENCED IN ALL PHASES OF INDUSTRIAL ENGINEERING WORK. PREFER MAN WITH STEEL PLANT BACKGROUND.

ADDRESS BOX S-889
Care *The Iron Age*, 100 E. 42nd St., New York 17

METALLURGICAL ASSISTANT — Opening in Metallurgical Dept. of large Midwest Automotive parts manufacturer. Prefer recent college graduate interested in production and process metallurgy. Write, stating age, school, and salary expected. Address Box S-885, Care *The Iron Age*, 100 E. 42nd St., New York 17.

ESTIMATOR—Midwest steel and alloy plate fabrication shop desires a mechanical engineer, experienced in estimating labor and material of tanks, piping, ducts, etc. Confidential. State age, former employers, education, experience and salary required. Address Box S-888, Care *The Iron Age*, 100 E. 42nd St., New York 17.

TINPLATE METALLURGIST — Several years experience in tin mill practice desired by container manufacturer for research and development. Eastern location. Give full details as to training, experience, draft status, etc. Address Box S-894, Care *The Iron Age*, 100 E. 42nd Street, New York 17.

ACCOUNTS WANTED

MANUFACTURERS AGENT

Accounts wanted by established reliable Manufacturers Sales Engineers calling on industrial accounts throughout northern Ohio, with offices in Cleveland, Akron and Toledo.

ADDRESS BOX P-209
Care *Iron Age*, 814 Park Bldg., Pittsburgh 22, Pa.

NEW YORK STATE. ACCOUNTS OR DISTRIBUTORSHIPS WANTED BY REPUTABLE NEW SALES AGENCY OPENING OFFICES IN BUFFALO JANUARY 1ST. HAVE WELL ESTABLISHED CONTACTS IN THIS AREA WITH MAJOR CONSUMERS OF CARBON, ALLOY AND STAINLESS PRODUCTION STEELS AND NON-FERROUS METALS. ADDRESS BOX S-890, CARE *THE IRON AGE*, 100 E. 42ND ST., NEW YORK 17.

SITUATIONS WANTED

AVAILABLE: TREASURER — CONTROLLER—ASST. TO PRESIDENT, AGE 41, EXPERIENCED IN ALL PHASES OF FINANCE, ACCOUNTING AND MANUFACTURING, INCLUDING STANDARD COSTS, GENERAL ACCOUNTING, TIMESTUDY, GOVERNMENT CONTRACT NEGOTIATIONS, TERMINATIONS, RENEGOTIATIONS, TAXES, BANK, RFC, INSURANCE LOANS, SYSTEMS, PROCEDURES, PLANT OPERATIONS, PRODUCTION. DESIRE POSITION COMMENSURATE WITH ABOVE EXPERIENCE. EXCELLENT REFERENCES. ADDRESS BOX S-882, CARE *THE IRON AGE*, 100 E. 42ND ST., NEW YORK 17.

PITTSBURGH STEEL REPRESENTATIVE. TRADER, EXPEDITER WILL REPRESENT DOMESTIC OR CANADIAN FIRM. MILL AND WAREHOUSE EXPERIENCE. GOOD DOMESTIC AND WASHINGTON CONNECTIONS. ADDRESS BOX S-884, CARE *THE IRON AGE*, 100 E. 42ND ST., NEW YORK 17.

ENGINEERING EXECUTIVE — Chief designer for prominent producer of gear manufacturing machinery desires similar position with progressive organization. 30 year background of engineering and administrative experience. Age 50. Address Box S-862, care *The Iron Age*, 100 E. 42nd St., New York 17.

PLANT SUPERINTENDENT — SUPERINTENDENT. Diversified Rolling Mill experience. Merchant and Rod Mill—Blooming and Strip Mills over twenty years supervisory experience. A positive hard hitting leader with the know how. Address Box S-868, care *The Iron Age*, 100 E. 42nd St., New York 17.

AGE 50. 30 years' experience all phases medium and heavy steel fabrication, machining and assembly. 22 years supervisory capacity to Plant Manager. Desires location Youngstown, Ohio or Los Angeles, Calif. area. Address Box S-892, care *The Iron Age*, 100 E. 42nd St., New York 17.

EXECUTIVE—experienced in shop operations, plant and industrial engineering, industrial relations and administration. Forging, foundry, melting, machining, assembly. Address Box S-893, care The Iron Age, 100 E. 42nd St., New York 17.

READ
THE ADVERTISING PAGES
● Equipment
● Materials
● Services
Sources for every need in the Metalworking industry.
THE IRON AGE

ADVERTISERS IN THIS ISSUE

A

Aaron Machinery Co., Inc. 263
Accurate Perforating Co. 251
Air Products, Inc. 143
Allegheny Ludlum Steel Corp. 50
Allen-Bradley Co. 51, 52
Allis-Chalmers Mfg. Co. 64
Aluminum Import Corp. 19
Alvey-Ferguson Co. 222
American Air Compressor Corp. 263
American Aluminum Ware Co. 270
American Blower Corp. 28, 29
American Brake Shoe Co., Brake Shoe & Castings Div. 132
American Lava Corp. 213
American Non-Gran Bronze Co. 271
American Screw Co. 94
American Shear Knife Co. 194
American Steel Export Co., Inc. 266
American Welding & Mfg. Co. 126
American Wheelabrator & Equipment Corp. 220
Ames, B. C., Co. 211
Angler Corp. 148
Arcos Corp. 112, 113
Armel, James P. 267
Armstrong Bros. Tool Co. 250
Artco Industrial Co., Inc. 265
Associated Spring Corp. 27
Atlantic Screw Works 94
Atlantic Steel Castings Co. 271
Atlas Car & Mfg. Co., The 108

B

Babcock & Wilcox Co., Refractories Div. 77
Barnes, Wallace, Co., Div. Associated Spring Corp. 27
Barnes-Gibson-Raymond, Inc., Div. Associated Spring Corp. 27
Bay City Forge Co. 271
Belmont Iron Works 273
Belyea Co., Inc. 260
Benkart Steel & Supply Co. 266
Bennett, Latcher W., & Sons 266
Bennett Machinery Co. 264
Bertsch & Company 257
Bethlehem Steel Co. 1
Billings & Spencer Co., The 251
Blake & Johnson Co., The 94, 205
Blashill, Arthur 268
Blaw-Knox Co. 73
Boiardi Steel Corp. 273
Brainard Steel Co. 138
Bridgeport Brass Co. 233
Brooks Chemicals, Inc. 118
Brown & Sharpe Mfg. Co. 17, 18
Brownell, Hazard Machine Tools, Inc. 262
Buckeye Tools Corp. 202
Buffalo Bolt Co. 150
Builders Steel Supply Co. 268
Bullard Co., The 121

C

Camcar Screw & Mfg. Corp. 94
Carboloy Dept. of General Electric Co. 20, 21
Carborundum Co., Refractories Div. 30, 31
Carpenter Steel Co., The 75
Cattie, Joseph P., & Bros. 254
Central Screw Co. 94
Chambersburg Engineering Co. 99
Cia Vale do Rio Doce 26
Cincinnati Gear Co., The 224
Cincinnati Grinders, Inc. 124
Cincinnati Shaper Co., The 4
Clearing Machine Corp. 196
Cleveland Crane & Engineering Co., The Tramrail Div. 187, 188
Cleveland Steel Tool Co., The 256
Colorado Fuel & Iron Corp., The Wickwire Spencer Steel Div. 156
Columbia Tool Steel Co. 249
Commercial Contracting Co. 250
Commercial Die Co. 271
Consolidated Railway Equipment Co. 268
Continental Foundry & Machine Co. 153
Continental Screw Co. 94
Continental Steel Corp. 241
Cooper Alloy Foundry Co. 206
Cowles Tool Co. 254
Cox & Sons Co., The 274
Craft Manufacturing Co. 269
Crawford, F. H., & Co., Inc. 266
Crucible Steel Castings Co. 255
Crucible Steel Co. of America 154
Cullen-Friestedt Co. 222
Cutler-Hammer, Inc. ..... Back Cover

D

Darien Corp. 268
Davidson Pipe Co., Inc. 266
Davis Keyseater Co. 254
Davis, Samuel M. 264
Delpark Corp. 63
Delta-Rockwell Power Tool Div. 183
Detroit Broach Co. 87
Detroit Hoist & Machine Co. 227
Diamond Manufacturing Co. 274
Dietert, Harry W., Co. 223
Donahue Steel Products Co. 262
Dony, D. E., Machinery Co. 264
Douglas, G. R. 270
Dow Corning Corp. 102
Dravo Corporation 22
Dreis & Krump Mfg. Co. 273
Dunbar Bros. Co., Div. Associated Spring Corp. 27
Duraloy Co., The 204
Dykem Company, The 275

E

Eagle Lock Co. 94
Eastern Machine Screw Corp. 271, 274
Eastern Machinery Co., The 261
Eastern Tool & Mfg. Co. 270
Eastern Tool & Stamping Co., Inc. 270
Eastman Kodak Co. 189
Easton Car & Construction Co. 250
Eaton Manufacturing Co., Fdry. Div. 49
Edmont Manufacturing Co. 219
Elco Tool & Screw Corp. 94
Electric Auto-Lite Co., Die Castings Div. 62
Electric Controller & Mfg. Co. 134
Electric Equipment Co. 267
Electric Furnace Co. 151
Electric Storage Battery Co., The 33
Electrolift, Inc. 251
Electro Metallurgical Company, a Div. of Union Carbide & Carbon Corp. 57
Electro Refractories & Abrasives Corp. 146
Elgin National Watch Co., Abrasives Div. 11
Employers Service Bureau 272
Engineering Mfg. Co. 251
Enterprise Galvanizing Co. 254
Erie Bolt & Nut Co. 209
Erie Foundry Co. 36
Espen-Lucas Machine Works, The 93

F

Fairbanks, Morse & Co. 45
Fairfield Manufacturing Co. 152
Falk Machinery Co. 264
Fate-Root-Heath Co. 71
Federal Press Co., The 24
Federal Products Corp. 13
Finkl, A., & Sons Co. 44
Foster, Frank B., Inc. 264
Frank, M. K. 268
Furnace Engineers, Inc. 139

Continued on Page 274

STEEL HAND AND POWER

CHICAGO BENDING BRAKES

For Single and Quantity Runs Bending Steel Plate and Sheet Metal

Special Bending Brakes
Double Folder Brakes

DREIS & KRUMP MANUFACTURING COMPANY
CHICAGO
7430 S. Loomis Blvd., Chicago 36, Illinois

PRODUCERS OF Hot Rolled ELECTRIC FURNACE QUALITY
BARS • SMALL SHAPES • STRIP
BOIARDI STEEL CORPORATION
900 Lower Market St. Milton, Penna.

THE BELMONT IRON WORKS

Structural Steel — Buildings & Bridges
Riveted — Arc Welded Cable Address — Belliron
Engineers — Fabricators — Erectors — Contractors — Exporters
SHOPS: PHILADELPHIA—EDDYSTONE—ROYERSFORD
Main Office: Phila. 46, Pa. New York Office: 44 Whitehall Street., N. Y. 4, N. Y.

• SET SCREWS • CAP SCREWS
• SPECIAL PARTS

SCREW MACHINE PRODUCTS
MADE TO YOUR ORDER

STEEL • BRASS • STAINLESS • ALUMINUM
send us your specifications for quotations
SAMUEL J. SHIMER & SONS, INC. MILTON 2, PA.

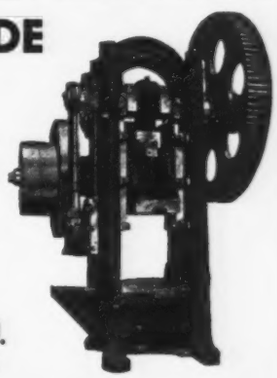
THE INTERNATIONAL HARDNESS SCALES
(BRINELL-SHORE)

are included in Our Improved Portable Sclerescope Model D-1. This efficient Single Scale tester registers Brinell-Shore values under otherwise inaccessible conditions. 100% portable for floor and field work, dead soft metals or superhard steel either of brittle or thin cross section, non-destructive, accurate, speedy, always ready and fool-proof.

Send for Interesting Technical Bulletin and Prices
THE SHORE INSTRUMENT & MFG. CO., INC.
9025 Van Wyck Ave., Jamaica, N. Y.

STRAIGHT SIDE PRESSES

The complete line of efficient Zeh & Hahnemann presses includes straight side presses, either single or double crank, for heavy blanking and forming operations. These are made with either a solid frame or a frame built up with the rods as illustrated. Ask for the Z & H catalog of modern presses.

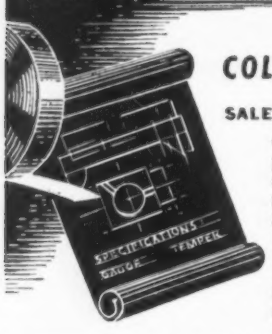


ZEH & HAHNEMANN CO.
Avenue A & Vanderpool St.
NEWARK, N. J.

To Your SPECIFICATIONS

GRIFFIN

COLD ROLLED STRIP STEEL



SALES AGENTS:

WM. H. LEONORI & CO., Inc., 30 Howard St., New York 13, N. Y.; CHARLES L. LEWIS, 1355 Market St., San Francisco 3, Cal.; J. J. LAMBERT, 323 Huntington Ave., Buffalo, N. Y.; CENTRAL STEEL & WIRE COMPANY, 13400 North Mt. Elliott, Detroit 12, Mich.; 3000 West 51st St., Chicago 80, Ill.; Box 148 Annex Station, Cincinnati 14, Ohio.

GRIFFIN MANUFACTURING CO. • ERIE, PA.

PELLETS For PEENING and CLEANING

PELLETS INC. BUFFALO, N. Y.

NEW YORK • DETROIT • CHICAGO

COX MACHINES

Pipe Cutting and Threading
Tube Cutting Off
Contract Machine Work

The Cox & Sons Company
Bridgeton, N. J.
Catalog upon request

ESTABLISHED SINCE 1868

H&C Insert Chaser DIE HEADS

famous for accuracy and straightness of threads, low chaser costs, less downtime, more pieces per day.

THE EASTERN MACHINE SCREW CORP., 21-41 Barclay Street, New Haven, Conn.
Pacific Coast Representative: A. C. Berkringer, 334 N. San Pedro St., Los Angeles, California Canada: F. F. Barber Machinery Co., Toronto, Canada

COPPER—BRASS—BRONZE
PERFORATED
TO YOUR REQUIREMENTS
SEND US YOUR DRAWINGS FOR PRICE
PERFORATED METALS
FOR ALL INDUSTRIAL USES
ALL SIZE AND SHAPE HOLES—ALL METALS
ARCHITECTURAL GRILLES
DIAMOND MFG. CO.
BOX 28 Write for Catalog 35 WYOMING, PA.

ADVERTISERS IN THIS ISSUE

Continued from Page 273

G

G G G Metal Stamping Co., Inc. 271
General Electric Co., X-Ray Dept. 92
General Machine Works 270
General Machinery & Equipment Co. 264
Gerrard Steel Stamping Div., United States Steel Co. 225
Gibson, Wm. D., Co., Div., Associated Spring Corp. 27
Gisholt Machine Co. 86
Gleason Works 32
Globe Trading Co. 266
Goodman Electric Machinery Co. 266
Goodyear Tire & Rubber Co. 10
Goss & DeLeeuw Machine Co. 256
Gould-National Batteries, Inc. 41
Great Lakes Screw Corp. 94
Greaves Machine Tool Co. 257
Green, A. P., Fire Brick Co. 39
Greenpoint Iron & Pipe Co., Inc. 266
Greist Manufacturing Co. 271
Griffin Manufacturing Co. 274

H

H and P Die & Stamping Co., The 271
Hammond Machinery Builders 203
Hannifin Corp. 95
Harper, H. M., Co. 94
Harrington & King Perforating Co., The 257
Hartford Steel Ball Co. 275
Haynes Stellite Company, a Div. of Union Carbide & Carbon Corp. 79
Hayward Company, The 256
Helical Tube Corp. 221
Hendrick Manufacturing Co. 225
Hevi Duty Electric Co. 212
Hoskins Manufacturing Co. Inside Front Cover
Hubbard, M. D., Spring Co. 255
Huebel Mfg. Co., Inc. 271
Hughes, Arnold Co. 266, 263
Hyatt Bearings Div. General Motors Corp. 90
Hydraulic Press Mfg. Co., The 15
Hyman, Joseph, & Sons 262
Hyman-Michaels Co. 268

I

Independent Pneumatic Tool Co. 16
Indiana Pressed Steel Co., Inc. 270
Indianapolis Machinery & Supply Co. 263
Industrial Brownhoist Corp. 67
Industrial Filtration Co. 63
Industrial Sales Co. 263
Ingersoll Steel Division, Borg-Warner Corp. 217
Inland Steel Co. 162
Insul-Mastic Corp. of America 12
International Nickel Co., Inc., The 69
Iron & Steel Products, Inc. 261
Ironsides Co., The 54

J

Jeffrey Mfg. Co., The 141
Jessop Steel Company 85
Johnson Machinery Co. 264

K

Kaiser Aluminum & Chemical Sales, Inc. 128, 194, 195
Kaydon Engineering Corp., The 137
Kemp, C. M., Mfg. Co., The 144
Kenilworth Steel Co., The 9
Kennametal, Inc. 214
Keokuk Electro-Metals Co. 159
Kinderman, Lou F. 267
King Foundries, Inc. 271
Klein Filter & Mfg. Co. 266
Knox, Earl E., Co 265

L

Lamson & Sessions Co., The 94
Lancaster Malleable Castings Co. 254
Land, L. J., Inc. 260
Landis Machine Co., Inc. 14
Lang Machinery Co. 263
La Salle Steel Co. 37
Laurens Brothers, Inc. 262
Lebanon Steel Foundry 223
Leland-Gifford Co. 256
Lincoln Electric Co. 161
Link-Belt Co. 58
Littell, F. J., Machine Co. 224
Lodge & Shipley Co., The 276
Logan Engineering Co. 149
Lumnite Div., Universal Atlas Cement Co. 96
Luntz Iron & Steel Co., The 237
Luria Bros. & Co., Inc. 239

M

MacCabe, T. B., Co. 267
Machine Tools Sales Co. 265
Mallory, P. R., & Co., Inc. 80
Manning, Maxwell & Moore, Inc. 227
Mathews Conveyer Co. 275
Mattison Machine Works 98
Maxwell Machinery Corp. 263
Meehanite Metal Corp. 70
Mesta Machine Co. Front Cover
Miles Machinery Co. 260
Mississippi Valley Equipment Co. 267
Morey Machinery Co., Inc., The 254, 265
Morgan Steel Corp. 271
Morris Machine Tool Co. 122
Morrison Railway Supply Corp. 268
Morse Chain Co. 89

N

National Bearing Div., American Brake Shoe Co. 193
National Bent Steel Co. 270
National Business Bourse, Inc. 272
National Forge & Ordnance Co. 252, 253
National Lock Co. 94
National Machinary Exchange 265
National Metal & Steel Corp. 266
National Steel Corp. 59
National Screw & Mfg. Co. 94
Neerup Industrial Equipment 266
New England Pressed Steel Co. 270
Niagara Blower Co. 215
Nicetown Plate Washer Co., Inc. 275
Northern Engineering Works 53

O

O'Brien, Clarence J. 264
O'Connell Machinery Co. 262
Oakite Products, Inc. 207
Ohio Locomotive Crane Co., The 256
Olson Manufacturing Co. 271
Osborn Mfg. Co., The 5
Ottemiller, Wm. H., Co. 256
Owen Bucket Co., The 257

P

Panama Canal Co. 268
Pangborn Corp. Inside Back Cover
Parker-Kalon Corp. 66, 94

ADVERTISERS IN THIS ISSUE

Paterson Steel & Forge Co. 271
Paxson Machine Co. 72
Pedrick Tool & Machine Co. 252
Pellets, Inc. 274
Pennsylvania Salt Mfg. Co. 56
Peterson Steels, Inc. 184
Pheoll Mfg. Co. 94
Philipp Brothers, Inc. 235
Pittsburgh Plug & Products Co. 254
Pittsburgh Rolls Div. of Blaw-Knox Co. 73
Pittsburgh Steel Co. 91
Platt Bros. & Co., The 256
Plymouth Locomotive Works Div. of The Fate-Root-Heath Co. 71
Poole Foundry & Machine Co. 255
Powdered Metal Prods. Corp. of America 160
Power Press Specialists 265
Production Steel Strip Corporation 119
Purdy Company, The 266

Q

Queen Stove Works, Almco Div. ... 145

R

Rail & Industrial Equip. Co., Inc. 267
Raymond Manufacturing Co., Div. Associated Spring Corp. 27
Ready-Power Co., The 216
Republic Steel Corp. 117
Ritterbush & Co., Inc. 258, 259
Rockford Screw Products Co. 94
Roebling's, John A., Sons Co. 48
Ross Carrier Co., The 218
Ruthman Machinery Co., The 255
Ryerson, Jos. T., & Son, Inc. 6

S

Saling Manufacturing Co. 271
Sauereisen Cements Co. 254
Scovill Mfg. Co. 94
Screw Research Assn. 94
Selas Corp. of America 88
Service Foundry Div. of Avondale Marine Ways, Inc. 253
Sessions, J. H., & Son 270
Sessions Foundry Co., The 271
Shakeproof, Inc. 94
Sharon Steel Corp. 8
Shepard Niles Crane & Hoist Corp. 208
Shimer, Samuel J., & Sons, Inc. ... 273
Shore Instrument & Manufacturing Co., The 273
Silent Hoist & Crane Co. 226
Simonds Gear & Manufacturing Co. The 248
Simonds Saw & Steel Co. 74
Smith, Thomas, Co. 270
Snap-On Tools Corp. 210
Solar Steel Corp. 230
South Bend Lathe Works 82
Southern Screw Co. 94
Southington Hdwe Mfg. Co., The 94
Stalwart Rubber Co., The 197
Standard Iron & Steel Co. 269
Standard Oil Co. of Indiana ... 46, 47
Standard Steel Spring Co. 60, 61
Standard Tube Co. 185
Stanley Works, The 226
Starrett, L. S., Co., The 83
Steel & Tube Div., Timken Roller Bearing Co. 69
Sterling Bolt Co. 78, 94
Stolper Steel Products Corp. 192
Stone, R. J. 267
Stronghold Screw Prods., Inc. 94
Sun Oil Co. 130
Superior Tube Co. 228
Summer & Co. 270

T

Tabor Manufacturing Co., The ... 275
Thomas Flexible Coupling Co. ... 203
Thomas Machine Manufacturing Co. 201
Timken Roller Bearing Co., The, Steel & Tube Div. 69
Titanium Alloy Manufacturing Co. 84
Torrington Co., The 97
Tractor & Equipment Co. 267
Tramrail Div., The Cleveland Crane & Engineering Co. ... 187, 188
Triplex Machine Tool Corp. 226

U

Udylite Corp., The 147
Union Carbide & Carbon Corporation, Electro Metallurgical Co. 57
Union Carbide & Carbon Corporation, Haynes Stellite Company 79
U. S. Drill Head Co., The 221
U. S. Industrial Tools 264
United States Steel Co. 100, 225
United States Steel Corp. 96
United States Steel Supply Div., United States Steel Co. 100
United States Stove Co. 266
U. S. Steel Wire Spring Co. 203
Universal Machinery & Equip. Co. 267

V

Vanadium Corp. of America 199
Van Huffel Tube Corp. 81
Vickers, Inc. 40

W

Wagner Electric Corp. 65
Wales-Beech Corp. 94
Wallack Bros. 268
Waterbury-Farrel Foundry & Machine Co. 23
Watson Stillman Co. 25
Wean Engineering Co., Inc., The 55
Weatherly Foundry & Manufacturing Co. 270
Weirton Steel Co. 59
Weiss, B. M., Co. 267
Weiss Steel Co., Inc. 268
Westinghouse Electric Corp. ... 34, 35
Wheland Co., The 227
Wickwire Spencer Steel Div., The Colorado Fuel & Iron Corp. ... 156
Wigglesworth Industrial Corp. ... 263
Wilcox Forging Corp. 271
Williams, Edward Hale 266
Willson Products, Inc. 198
Wilmot Engineering Co. 153
Wolverine Tube Div. of Calumet & Hecla Consolidated Copper Co. 186
Wyandotte Chemicals Corp. ... 190, 191
Wyckoff Steel Co. 248

Y

Yoder Co., The 33
Youngstown Sheet & Tube Co., The 76

Z

Zeh & Hahnemann Co. 273

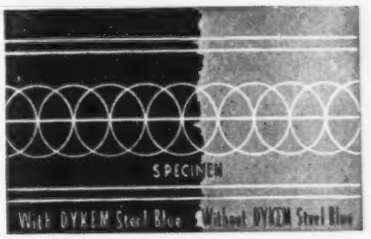
CLASSIFIED SECTION

Business Opportunities 268
Clearing House 258-263
Contract Manufacturing 269-271
Employment Exchange 272
Wanted 268

DYKEM STEEL BLUE

STOPS LOSSES

making dies & templates



Simply brush on right at the bench; ready for the layout in a few minutes. The dark blue background makes the scribed layout lines show up in sharp relief, and at the same time prevents metal glare. Increases efficiency and accuracy.

Write for full information

THE DYKEM COMPANY, 2303G North 11th St., St. Louis 6, Mo.

Hartford STEEL BALLS

A PRODUCT OF INGENIOUS MACHINERY AND SKILLED CONNECTICUT OPERATORS

STEEL, BRONZE, MONEL, STAINLESS STEEL AND ALL WORKABLE MATERIALS

Any Quantities . . . THE HARTFORD STEEL BALL CO., HARTFORD 6, CT.

TABOR ABRASIVE CUTOFF MACHINES

They're *cut out* to *cutoff* bar stock and shapes

Send for literature. Specify shape, size and material to be cut.

TABOR Manufacturing Co.

6222 Tacony St., Phila. 35, Pa.

10 H.P. 3 H.P.

WASHERS TO SUIT YOUR NEEDS

STANDARD - BEVEL - SQUARE - SPECIAL

GALVANIZED OR CADMIUM PLATED

ALSO MANHOLE STEPS

NICETOWN PLATE WASHER CO., Inc.

JUNIATA AND CLARISSA STS.

NICETOWN PHILADELPHIA 40, PA.

MATHEWS CONVEYERS

Since 1905. Engineers and manufacturers of Conveyers and Conveyer Systems for the Metal-Working Industries.

Three modern plants. Engineering Offices in All Principal Cities. There's an Engineering Sales Office near you.

MATHEWS CONVEYER CO.

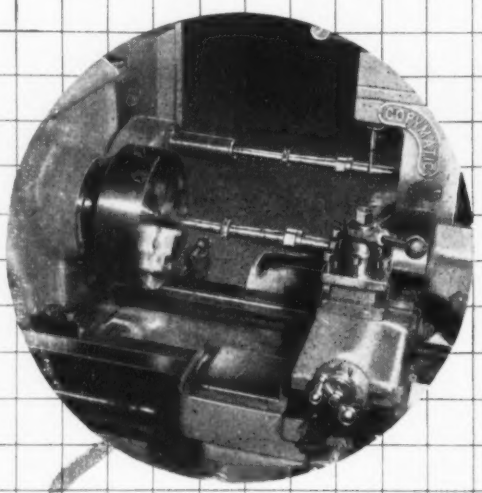
ELLWOOD CITY . . . PENNSYLVANIA

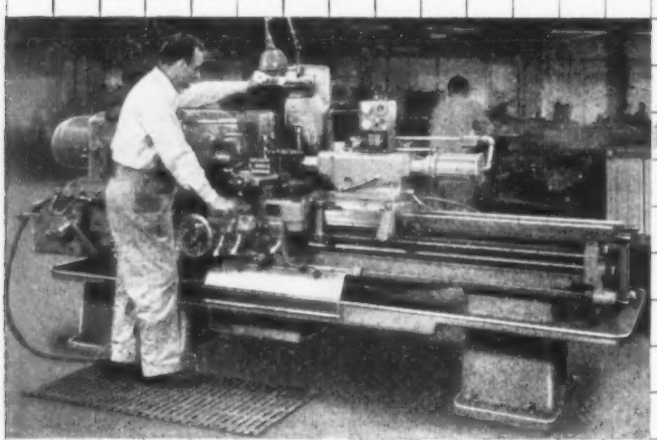
SAN CARLOS . . . . . CALIFORNIA

PORT HOPE . . ONTARIO, CANADA

(Oil equipment manufacturer reports)

production increased at least 60%





with Lodge & Shipley copymatic

COPYMATIC form turning various oil well equipment items at Otis Engineering Corp., manufacturing affiliate of well-known Otis Pressure Control, Inc., Dallas, Texas.

In the production of sub-surface controls which must be placed and operate in oil well casings far underground, the precision and speed of the Lodge & Shipley COPYMATIC Lathe are valuable assets. This manufacturer says, "tolerances can be held closer . . . the COPYMATIC can be used as tracer type or conventional lathe . . . is very easy to operate."

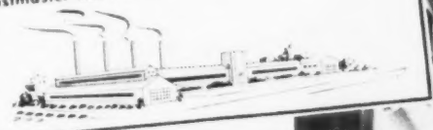
On a typical job, 303 Stainless is turned for O.D. and taper at 549 RPM and .0067" feed, using Kennametal K3H tools. On this and other jobs involving form boring and threading, the user "has been very successful in decreasing production costs over the use of conventional lathes."

In any size shop . . . on a multitude of operations . . . the speed and versatility of the COPYMATIC, coupled with the accuracy of the Lodge & Shipley Model X Lathe, turns out more work at lower cost. For additional case histories, complete details, write:

THE Lodge & Shipley COMPANY
3061 Colerain Avenue
CINCINNATI 25, OHIO

From Foundry Show at Atlantic City to Riverside Foundry Company's work floor—that's the story of this Pangborn Blastmaster ROTOBLAST Barrel.

Note the signs painted on the machine for the Show are still visible.



Doubles Cleaning Output per man-hour*

with Pangborn Blastmaster ROTOBLAST® Barrel

*at Riverside Foundry Co., Wrightsville, Pennsylvania

The same Pangborn Blastmaster ROTOBLAST Barrel that was the sensation of the 1952 Foundry Show is an even greater sensation on the job! Delivered directly from the floor of Convention Hall to the Riverside Foundry Co., Wrightsville, Pa., the Barrel has already more than doubled the cleaning output per man-hour at this jobbing foundry! And Riverside officials are sold on the high quality of cleaning, the wide range of sizes of castings that can be cleaned, and the absolute abrasive-tightness of the machine.

No matter what you clean—large or small castings, fragile or intricate castings, or any combination—there's a modern ROTOBLAST unit to do a better job for you at far lower cost. Write for details. Ask for Bulletin No. 223 (Blastmaster Barrel) or No. 214 (all ROTOBLAST equipment). Address: PANGBORN CORPORATION, 1500 Pangborn Blvd., Hagerstown, Md.

OVER 28,000 PANGBORN MACHINES SERVING INDUSTRY

Pangborn

Look to Pangborn for the latest developments in Blast Cleaning and Dust Control equipment

BLAST CLEANS CHEAPER

with the right equipment for every job

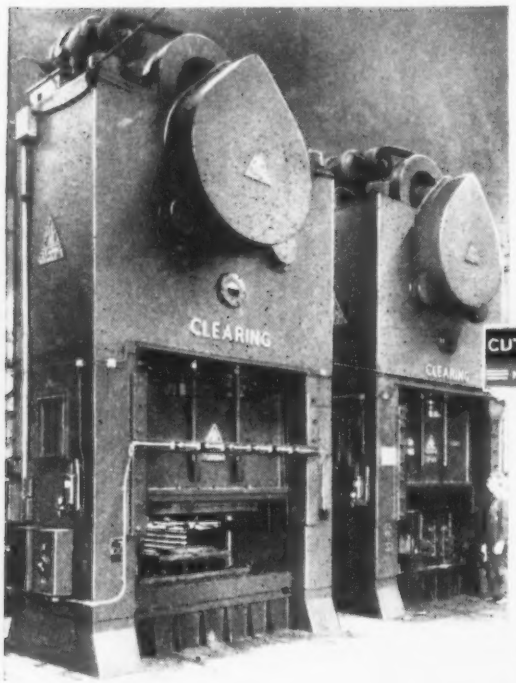
How ROTOBLAST works for you:

- *SAVES LABOR* with push-button operation
- *SAVES SPACE* because machines are compact
- *SAVES TIME* by cleaning more loads per day
- *SAVES POWER* since no compressor is needed
- *SAVES TOOLS* because all scale is removed

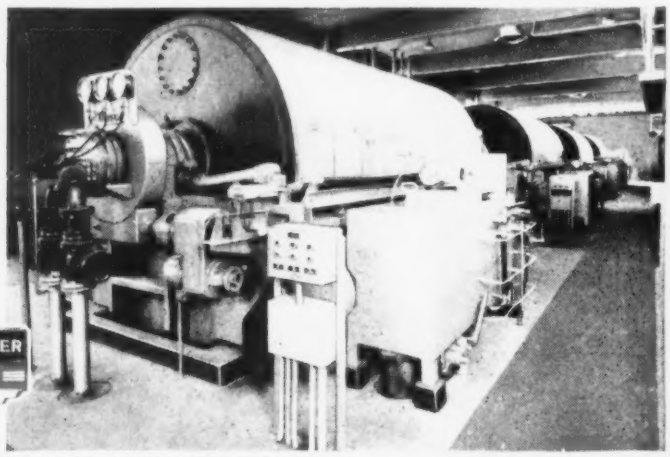
Choice of the Leaders

CUTLER-HAMMER
MOTOR CONTROL
C-H

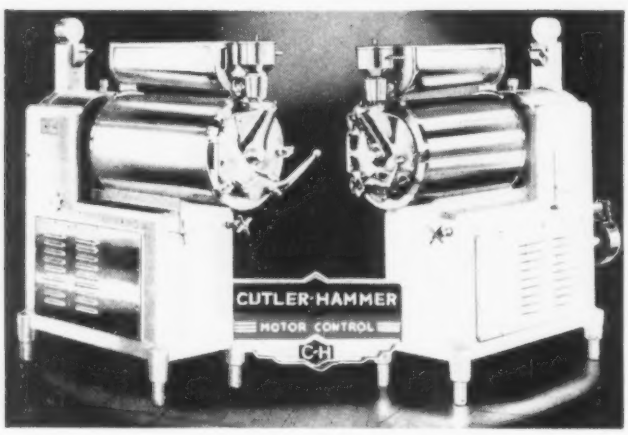
The Mark of Better Machines



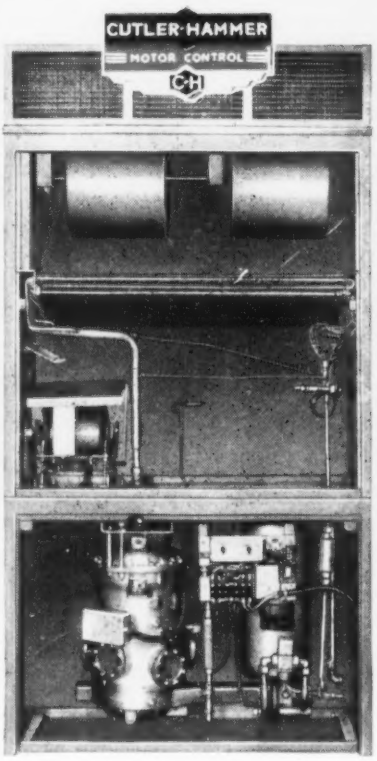
CLEARING MACHINE CORPORATION DRAW PRESSES EQUIPPED 100% WITH CUTLER-HAMMER MOTOR CONTROL.



OLIVER UNITED FILTERS INSTALLED IN LARGE SEWAGE TREATMENT PLANT AND COMPLETELY EQUIPPED WITH CUTLER-HAMMER MOTOR CONTROL.



CHERRY-BURRELL DUO-DASH SANITARY BATCH FREEZERS MADE BY CHERRY-BURRELL CORPORATION AND EQUIPPED WITH CUTLER-HAMMER MOTOR CONTROL.



AIRTEMP MODEL 1008 AIR CONDITIONER WITH PANELS REMOVED TO SHOW MECHANISM; ONE UNIT OF COMPLETE LINE MADE BY AIRTEMP DIVISION OF CHRYSLER CORP. USING CUTLER-HAMMER MOTOR CONTROL.

Proof of Dependability

The repeated selection by a leading manufacturer of a device for inclusion in his product has a lot of meaning. In all evidence the device has proved its dependability to his satisfaction. Look at the facts. The leadership of any company can only reflect the market's approval of its product. The market thus favors the product above many others . . . preferring it because of demonstrated superiority in actual use. But such position of commercial advantage is not easily won. Nor easily held. That is why leading manufacturers follow a policy of scrupulous attention to every detail influencing product performance in the user's hands. Therefore, it is important to note how frequently and continuously so many leading machinery manufacturers select Cutler-Hammer Motor Control for their machines. There can be no better proof of the dependability of this control. And no better reason for you to specify it, too. CUTLER-HAMMER, Inc., 1325 St. Paul Ave., Milwaukee 1, Wis. *Associate:* Canadian Cutler-Hammer, Ltd., Toronto, Ontario.